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Contributions.

The Use of Steel for Freight Cars.

PHILADELPHIA, Feb. 30.

TO THE EDITOR OF THE RAILROAD GAZETTE:

The next great revolution in the use of steel will be the building of complete steel freight cars. The cost of a steel car fifteen years ago would have been several times that of a wooden car, rendering its use impracticable. To-day it is possible to build a complete steel car for about the same cost, per ton carrying capacity, as a wooden car, and the advantages from the transportation point of view are very great. The saving in dead weight is a large factor in this direction, as also is the saving in repairs, and incidentally the absence of risk from fire, while the life of the car would be, say, three times as great.

The subject is now being agitated by railroad engineers to a considerable extent, and this has been brought about largely through a few who have been the pioneers in introducing pressed steel shapes in place of castings and wood wherever it has been possible to do so, thereby lightening the present style of freight car, and practically proving up the various parts so that the adding of underframing and the balance necessary to make a complete structure cannot be considered as an experiment, except in so far as the design is concerned.

The rates for freight per ton have been growing less and less each year, much faster than the decrease in cost per ton of hauling it; resulting in decreased earnings to such an extent as to make the payment of dividends possible only where the most favorable conditions prevail. This condition of affairs is causing many railroad managers and engineers to look into the question of the economies to be effected by the introduction of steel cars of light weight and large carrying capacity as a means of relief. Indeed they are compelled to do this, and this fact will aid in bringing about a revolution in the whole system of car construction in the near future to such an extent that wooden cars will be the exception rather than the rule, as it is to-day in bridge construction.

For example, take a saving of 5,000 lbs. per car in dead weight as compared with a wooden car of equal capacity in an equipment of 1,000 cars; that means the saving in haulage of 5,000,000 lbs. or 2,500 net tons. It has been computed that it costs in round figures \$10 per annum to haul one ton of dead weight on the basis of the average mileage made per car per annum. This would mean a saving of \$25,000 per annum on 1,000 cars alone (saying nothing about the saving in repairs), a sum equal to the interest on their cost. Applying this to the 1,250,000 cars which constitute the freight equipment of the United States, and the saving would amount to the enormous sum of \$31,250,000. Of course, these cars cannot be so altered as to effect this saving. It should, however, serve as an object lesson, and cause every railroad man, charged with the responsibilities regarding the possible economies in this direction, to look well and carefully into everything which will tend to lessen the dead weight and produce a permanent structure, such as may be found in a completed steel freight car.

It is gratifying and encouraging to note in this direction that one railroad has decided to have built 200 steel cars of large carrying capacity and light weight as compared with the carrying capacity of wooden cars. The cars are to be built wholly of steel in so far as the truck frames, underframes and bodies are concerned, the wheels, of course, being cast, and no wood in the entire structure. It is the intention to run these cars in solid trains and thoroughly demonstrate this question. The results will be looked forward to with a great deal of interest by railroad men, and if all that is hoped for be

realized, of which there can be no reasonable doubt, it can be looked upon as the starting point in the evolution of the comparatively crude vehicle of transportation of to-day into the perfect structure for freight service.

CHAS. T. SCHOEN.

Failures in Reservoirs.

PHILADELPHIA, Feb. 8, 1897.

TO THE EDITOR OF THE RAILROAD GAZETTE:

As it has been frequently asserted that "all reservoirs leak," and as it was claimed in a recent argument that the contractors had not agreed to make a reservoir that would hold water, although the specifications required them to construct "a complete and perfect reservoir ready for use," it became a matter of interest to the engineering profession to know whether such technical constructions and loose statements are to remain unchallenged. The writers have devoted much time to searching records of failing reservoirs to ascertain their causes of failure and their utility on being completed and tested, and after considerable research in various American and foreign journals they have found some interesting results which may be summarized about as follows:

All reservoirs may fail from one or more of three fundamental defects, as stated in your issue of January 8, to wit, from a defective *site*, bad *construction* or imperfect *design*. In an analysis of a score of failures, so far as can be determined from the more or less meager records, the following results were obtained: There were two failures due to the site alone; two others were traceable to defective construction and three to design; while two involved both site and construction; two more, all three elements; three, site and design and six, design and construction.

The weak point in the site was generally found to be in failure to secure suitable foundations for banks and abutments, due to caverns or fissures beneath; those in construction arose generally from imperfect bond between sub- and superstructure, defective puddling or weak masonry due to incompetent inspection; and those in design were mainly from a desire to economize in material whereby the dimensions of vital parts were reduced beyond safe limits or ordinary precautions omitted altogether.

Ordinarily no mention is made of the leakage upon testing, yet in a few instances it is recorded that there was "no leakage." A common error in reservoirs over 20 ft. deep consists in the omission of berms on the inner slope and of the abutments at its foot to support the lining, as well as in making this slope too steep. The best English practice requires a slope of 1 to 3, while in this country it is often as great as 1 to 1½. This is exemplified in the case of the Brooklyn, Philadelphia, Providence and other reservoirs. In some of these cases it was found that the same design which answered perfectly all the conditions for one site was signally defective on another, so that the structure had to be disconnected and remains at present unused. In this case failure is attributed mainly to defective puddling on a sandy subsoil.

Many earth dams fail from being overtopped by floods due to insufficient waste-weirs, as was the case at Johnstown, or to improper bedding of the pass-pipes in the face of the dams. These are classed under defective designs, but perhaps the most serious errors are due to the great diversity of opinion and practice in making and applying puddle. It is usual to find specifications calling for "the best quality of clay," or clay free from sand, gravel, mica or other injurious material. Such statements reveal an ignorance of the properties of clay, which may prove fatal, since there is no earth which is more susceptible to water under the influence of heat or frost, nor which expands or contracts with greater energy; while what is wanted in a good puddle is a substance which will resist such action of the elements, which will retain its equilibrium, resist the attacks of animals and pack well in place. The natural product which best fulfils these conditions is "hard pan," or cemented gravel, which may contain very little clay or loam, but which requires a pick or crowbar, and sometimes blasting, to excavate.

Mr. W. J. McAlpine, one of our most distinguished hydraulic engineers, once said: "Many young engineers fill their trenches with clay puddle. I greatly prefer fine gravel, having a little loam mixed with it." In describing the New Bedford Reservoir (Mass.), he said: "The banks are of coarse and fine gravel and sand, which, when carefully selected and placed in large banks, become perfectly water-tight. The dam was in the middle of a heavily timbered swamp with muck for from 2 to 6 ft. in depth. . . . There was an ample puddle wall in the middle extending to the hard pan and generally 4 to 6 ft. below it. The puddle was made of the best material, viz., fine gravel mixed with coarse and fine sand and loamy sand from the surface, incorporated by the free use of water and cutting with spades. . . . The water covered 200 acres and was 20 ft. deep at the dam. . . . Frequent examination showed no leakage. (It broke from a failure of the valve.)

"The first cofferdam of the United States dry dock gave way chiefly because it was filled with clay, while the one filled with gravel withstood a much greater pressure. The particles of clay are cohesive, and a vein of water ever so small will continually wear a larger opening. An embankment of gravel is comparatively safe and becomes tighter every day, while one of clay is tighter at first, but always liable to breakage."

wall was built in layers of 6 in. cut by a garden spade into 1-in. cuts and then crosscut in same manner, causing a shrinkage to $4\frac{1}{2}$ in. Pea gravel was mixed with the clay; from 15 to 25 per cent. of gravel was used, which varied from $\frac{1}{4}$ to $\frac{3}{8}$ in. in diameter.

It follows that each case must be treated on its merits and that no very definite proportions can be given for mixing the ingredients of puddle, yet it is believed excellent results may be obtained by using a much larger percentage of gravel and sand than the above. Since the purpose of the sand and clay or loam is to make a matrix which shall thoroughly fill all the pores of the coarse material, the percentages should be obtained by experimenting with the best material available at or near the site. The proportions ^a given by Fanning (p. 341) are for puddle, common gravel, 1 cu. yd. sand, 0.36 cu. yd.; clay, 0.25 cu. yd.; total, 1.61 cu. yd., or reducing these to percentages, they are for gravel, 62; for sand 22½, and for clay only 15½ per cent.; by measure, one, one-third and one-fourth, thoroughly mixed with the proper quantity of water to make a unit of volume.

As many reputable engineers scout the thought of using anything but pure clay for puddle these suggestions are respectfully submitted in the hope that they may be of service to the profession and with the belief that "We learn more from our failures than from our successes,"

HAUPT & FRANKLIN.

A New Record for Long-Distance Running.

On Feb. 15 a run was made from Chicago to Denver over the Chicago, Burlington & Quincy and the Burlington & Missouri River railroads, with a special train, which establishes a new record for fast, long-distance running. The circumstances of this performance are so peculiar that it is necessary to first consider them.

Mr. H. J. Mayham left New York Sunday morning (Feb. 14) at 10 o'clock, on the Pennsylvania Limited, his desire being to reach Denver before his son should die. The first notice which the Chicago, Burlington & Quincy officials received was a telegram sent from Fort Wayne, Ind., asking for what amount a special train would be run from Chicago to Denver. This was received about 6:30 Monday morning, and as the message gave no particulars, no action was taken until Mr. Mayham reached Chicago at 9:10, when he was met at the station by one of the Passenger Department, and by 9:30 orders were given to have an engine and the private car (No. 98) of the General Superintendent, at the Union Station as soon as possible. The car was provisioned after receiving these orders, and by 9:45 all was ready and the train standing in the Union station. The start was made at 10 o'clock.

The Chicago, Burlington & Quincy Railroad received one dollar a mile for this train, a total of \$1,025, and there was no guarantee to make the run in any stated time; the intention was merely to run on about the same schedule as the fast mail trains.

Table I. shows the official figures for the run, giving the distance between stations at which stops were made, time of arrival and departure and cause of delay.

The first stop made after leaving the Union Station was at the Commissary at Sixteenth street for supplies, where four minutes were lost. It required 12 minutes to reach Western avenue, while the same distance is made by fast mail trains in nine minutes. This was due to the stop at Sixteenth street. The crossing stop at Western avenue required two minutes; Aurora was the next stop made. Besides the crossing stop at Earlville no stops were made between Aurora and Mendota.

It was not until the train was well into Iowa that the officers decided to attempt a record run, and orders were then issued for the engineers to run as fast as was safe. Because of the train making so much better time than was expected, at many of the division points where engines were changed, there was scarcely more time to get the new engines ready than at Chicago.

A total of 21 station stops was made between Chicago and Denver, consuming in all 64 minutes. This time, taken out, does not include 14 stops made for railroad crossings by which approximately from three to four minutes were lost at each crossing. The actual time between Chicago and Denver, a distance of 1,025 miles, was 18 hours 53 minutes, making the average speed 54.27 miles per hour. Deducting 64 minutes for station stops (not including time lost at 14 railroad crossings) the running time was 17 hours 49 minutes, or at an average rate of 57.53 miles an hour.

Table II. shows the length of run of each engine, the stations between which each engine was used, number of engine and class, and names of the engineers and firemen. The weight of car No. 98 is 72,000 lbs.

Throughout, there was, with one exception, no delay and this did not prove to be serious. Soon after leaving Creston it was found that a box on one of the engine trucks was heating, but in spite of this fact the run of 36 miles to Villisca was made in 34 minutes. At Red Oak engines were changed, one used on the Nebraska City Branch taking the train forward. Seven minutes was lost at Red Oak; this time was not wholly taken up changing engines, but the greater portion was lost in getting new train orders, as orders had been given to run to Pacific Junction, but when the engines were changed at Red Oak, the train lost its rights and new orders had to be secured.

The Chicago, Burlington & Quincy has no very heavy grades. Through Iowa there are a few grades as steep as one per cent., ranging from one to three miles long. The elevation of the tracks in the Union Station at Den-

ver is 4,582.72 ft. above the tracks in the station at Chicago. This elevation is attained gradually and with the very light train used on this occasion the grades had no practical effect on the speed, and can be disregarded entirely. Approximately 70 per cent. of the Chicago, Burlington & Quincy and Burlington & Missouri River railroads is single track.

The time required to change engines at the various division points is as follows:

	Time, minutes.
Burlington.....	3
Creston.....	2
Pacific Junction.....	2
Lincoln.....	2
Hastings.....	1
McCook.....	2
Akron.....	2

In connection with this fast run it is interesting to note that the fast train, No. 3, which left Chicago at 10:30 Sunday night, was overtaken and passed by the special at Oxford, while No. 5, which left Chicago Sunday evening at 5:50, was passed at Akron.

TABLE I.—THE BURLINGTON'S FAST RUN.

Miles.	Miles between stations.	Mins. between stations.	Stations.	Time lost.	Remarks.
0			Chicago (depart 10 a. m.)		
1	1	4	(Commissary).....	4	Supplies.
37	36	37	Aurora.....	1	
83	46	44	Mendota.....	3	Took water.
163	80	85	Galesburg.....	4	Took water.
206	43	48	Burlington.....	3	Changed engines.
261	55	61	Krum.....	3	Took water.
281	20	23	Ottumwa.....	2	
304	23	24	Maxon.....	2	Crossing and oiling engine.
336	32	33	Charlton.....	5	Took water and oiled engine.
363	27	28	Oscuela.....	2	Sent W. U. message.
396	33	32	Creston.....	2	Changed engines.
432	36	34	Villisca.....	5	Hot truck.
447	15	15	Red Oak.....	7	Changed engines and received new orders.
482	35	38	Pacific Junc.....	2	Changed engines.
541	59	64	Lincoln.....	3	Changed engines.
610	69	73	Sutton.....	3	Took water.
638	28	33	Hastings.....	2	Changed engines.
716	78	75	Oxford.....	4	Took water and oiled engine.
770	54	51	McCook.....	2	Changed time and engine and took water.
860	90	97	Wray.....	2	Took water.
913	53	52	Akron.....	2	Changed engines.
978	65	69	Rosgen.....	3	Took water.
1,025	47	51	Denver (Union Depot) (arrive 3.53 a. m.)	64	
1,025	1,069				

Railroad crossing stops not deducted except at Maxon, Ia. 1,025 miles, Chicago to Denver 18 hours 53 minutes = 54.27 average miles per hour.

Actual average running time, 17 hours 49 minutes = 57.53 miles per hour.

	Cylinders.	Driving wheel centers.	Steam pressure.	Total weight in working order.
	Inches.	Lbs. per sq. in.	Lbs.	
Class A-17; 8-wheel.	17 in. x 24 in.	56	165	79,800
" A-18; 8-wheel.	18 in. x 24 in.	56	165	79,800
" H; mogul.....	19 in. x 24 in.	62	185	110,000
" K; 10-wheel.....	19 in. x 24 in.	62	185	120,000

The Car Accountants' Association.

The annual meeting of the International Association of Car Accountants was held at New Orleans this week. The report of the proceedings is not yet received, but we give below the report presented to the association by the Committee on Car Service. This committee deals with all the most important topics which come before the association, and the report, it will be seen, is admirable in its directness and brevity.

REPORT OF THE COMMITTEE ON CAR SERVICE.

Box Cars Classed as Refrigerators.—Your committee thinks it important to call the attention of the association again to the fact that many operators of private car lines have classed certain box cars as refrigerator cars, which are without ice-boxes, and being used for the transportation of ordinary freight, have no right to be credited with the refrigerator car rate. The committee renews the recommendation made at the last meeting, that this association request the owners of such cars to classify them as ordinary box cars in their equipment lists in the Official Railway Equipment Register, and that their services be paid for at the rate of six-tenths instead of three-fourths of a cent per mile.

Car Service Associations.—Your committee feels that the Car Service Associations which have been established throughout the country have done good service in reducing the delay to loaded cars and it thinks that the influence of this association should be exercised toward the maintenance of these car service associations and the strict enforcement of their rules against the detention of cars.

Line Marks on Freight Cars.—Your committee refers to the subject of line marks on freight cars simply to repeat what seems to be the opinion of many railroad officials, that line marks tend to restrict the performance of the cars, and that this disadvantage is not compensated by any advertising to such lines gained through the marking on the cars. Where one railroad has assigned certain cars from its equipment into some three or four different freight lines it seems to be unquestionably true that the performance of such cars will not be as large nor their utility as great as if they were all equally free to be used without regard to line restrictions.

Per Diem.—Your committee feels that the general subject of per diem should not be dropped from the consideration of the association. At the same time this important subject has largely been taken out of our hands and rests with our superior officers in the Ameri-

can Railway Association. The first consideration which seems to keep the importance of a per diem charge ever uppermost is the possibility of error either through mistake or design on the part of those who compute railroad mileage under the present plan. The principal argument in favor of per diem is this: That the owners of cars that run upon foreign roads can compute their earnings from their own books, instead of depending upon

commercial considerations—and also insisted on the value of added silicon.

My paper has been honored by the favorable consideration of a number of the engineers and other controlling officers of Western roads, and it resulted in 186,000 gross tons of rails of sections heavier than 65 lbs. per

TABLE II.—THE BURLINGTON FAST RUN.

Miles run.	Stations.	Engine No.	Engineer.	Fireman.	Class of engine.
206	Chicago to Burlington.....	8	N. B. Varina.....	Wm. Watson.....	A-17
190	Burlington to Creston.....	250	R. Maxwell.....	R. J. Dietline.....	A-18
51	Creston to Red Oak.....	232			H
35	Red Oak to Pac. Junction.....	16	B. F. Deffenbaugh.....	A. Bennett.....	A-17
59	Pac. Junction to Lincoln.....	233			A-18
97	Lincoln to Hastings.....	227	G. W. Allis.....	F. T. Maloy.....	A-18
132	Hastings to McCook.....	210	D. Magner.....	S. M. Cole.....	A-18
143	McCook to Akron.....	324	C. M. Bailey.....	J. M. Trammell.....	K
112	Akron to Denver.....	228	John Meiser.....	F. L. Worden.....	A-18

the books of those who have used them. This is simply the principle that governs every other feature of railroad business, as well as all other forms of business. In other words, the true amount of the figures is known to both parties. Your committee thinks that this principle has sufficient force to justify the discussion of the per diem plan until it or something equally good is adopted instead of the present irresponsible system. Your committee furthermore recommends that it should be made one of the principles of your association that when any railway officer designedly withholds mileage with intention to defraud he shall never, if a member of this association, be elected to any office nor appointed on any committee.

Advertising Signs on Cars.—The American Railway Association in October last adopted a resolution recommending that railroad companies issue instructions prohibiting shippers from mutilating and defacing cars by nailing, pasting or otherwise placing advertisements or placards of any kind upon freight cars. Your committee believes that this rule should be strictly enforced on all railroads, and that no concessions should be made to shippers on this point.

Car Seals.—On the subject of car seals your committee feels that there is no general system in practical use by which a full complete record is kept at any one point, by any one road, showing condition of all car seals. The very fact that such permanent and complete records have not been established seems to indicate that the results can be reached by other methods. Is it not a sufficient source of information on this subject to have the conductors carefully note in their pocket memorandum books the condition of each seal in their trains, thereby enabling claims to be checked by reference of the papers to the conductor who handled the car that is involved in the claim?

Diversion of Cars.—Your committee feels that the diversion of cars should be most carefully guarded against. The equipment of a railroad company is a property much too valuable to justify its diversion in carrying freight which will not bring any revenue whatever to the owner of the cars, unless such movement be in the direction of home. It should therefore be one of the ethics of the railroad profession to treat foreign cars with absolute fairness, applying the golden rule whenever they are distributed for loading.

Large Cars.—Your committee views with much regret the continued increase in the size of box cars. The building of box cars beyond the standard dimensions seems to be fraught with many disadvantages, including direct loss of revenue to the railroads, without any compensating considerations. Your committee feels that the root of this trouble lies in the existing freight classification, which has established a set of minimum weights of loading which are higher on the average than the capacity of the cars. The result is that a shipper who desires to forward a carload of freight is compelled to pay on a minimum of, say, 20,000 pounds, while the car that is set for his accommodation, if of standard size, will probably hold only 12,000 pounds. The result is that he pays for 8,000 pounds which he does not ship. The man next to him also ships a carload and is given a furniture car that holds the required minimum, the railroad company receiving the same price from each shipper, but carrying 8,000 pounds more for the second man. This necessarily occurs every day on account of the classification rules, and the continued practice of building large furniture cars, instead of obviating the difficulty, really aggravates it. The gentlemen in charge of the official classification have for several years appeared to feel a grave concern over this question, and they have held many meetings which have been called in response to the earnest demand of those who distribute cars that this ill-conditioned classification shall be amended. Their frequent deliberations have borne no fruit, however, except the elaborate explanation of "how not to do it." In the meantime the demand for furniture cars for ordinary commodities becomes every day more general, and makes the necessity for a sensible and intelligent revision immediate and imperative. Your committee feels that a sure and simple method of adjusting this unnatural condition of things would be for the Classification Committee to at once revise the classification, provide a set of minimums graded to the cubic capacity of the cars, establish a uniform size of car as a standard, and charge a sliding scale of, say, three per cent. per foot of length for all cars of larger or smaller size than the standard.

S. H. CHURCH, Pennsylvania Lines,
H. J. MERRICK, L. S. & M. S.,
J. L. BRASS, Chicago Great Western,
G. S. CANTLIE, Canadian Pacific,
O. W. STAGER, Philadelphia & Reading,
T. M. MAGIFF, Central Vermont,

Committee.

The Chemistry of Western Rails.*

At the Atlanta meeting of the Institute, October, 1895, I had the honor of presenting a paper on "Specifications for Steel Rails of Heavy Sections Manufactured West of the Alleghanies." In it, reasoning from the experience of Western railroads with heavier sectioned steel rails, I called attention to the importance of the chemical composition of the steel, and urged the increase of the carbon percentage, and the limiting of phosphorus to the lowest point reconcilable with com-

yard being manufactured since that time in accordance with my views. These rails are in the tracks of several large railroad systems. In giving the above tonnage I refer only to the rails which came under my immediate supervision; that is, under the inspection of my firm. Over 69,000 tons were 80 lbs. to the yard. In some cases it was not commercially possible to obtain quite as low a percentage of phosphorus as desired, and hence the carbon was reduced proportionally, but, as a whole, the rails could be classed as high carbon ones.

Of course it is too soon to form a positive opinion in relation to the wear of the rails, but practically all of them have been in service long enough to demonstrate their safety, and I believe in all cases the users of the rails unite in the opinion that so far they promise much better wearing results than previously obtained, and I know in several instances, based on such showing, still harder steel will be insisted upon in this year's deliveries.

I present this short article somewhat in the nature of a "report of progress." Moreover, in view of the recent somewhat surprising developments in the American rail trade, it is well not to lose sight of the necessity of not permitting low prices to be the only consideration. The first cost of rails is not all the story. This does not require discussion. If it is necessary to pay a little more for a good rail, true economy speaks in no uncertain voice in favor of so doing. Low prices are very attractive, but subsequent economies in track maintenance, repairs to rolling stock, possibilities of high speed and comfort of passengers must not be ignored.

The peculiarities of human nature must be remembered. They do not change very much. When articles are sold at a low price those in direct charge of the manufacture of them will, most likely, be expected to keep cost of production down to a corresponding degree. This may lead to temptation to cut some corners which had better have remained in full projection. At all events it does not seem wise to ignore past experience in steel rail metallurgy.

The New Interlocking Signals at Hartford.*

Mr. MILES: Mr. Rudd has made some reference to my prices for foundations. I will say that he has evidently misunderstood quotations given in my paper of last year, as he speaks of cranks and compensator foundations, and I only quoted prices on pipe carrier foundations.

Mr. VERNON (by letter): I saw a description of this plant in the *Railroad Gazette* of Aug. 14, but did not give it very much study at the time, as I intended to look it over more carefully later. If I remember right, Mr. Rudd did not lock his trailing switches; of course a trailing switch is just as safe unlocked as locked while a train is running in one direction, but if a train should have to stop on a trailing switch and then move in the opposite direction it would have to pass over an unlocked leading switch. Operators are apt, with a switching engine, to give them the switch and a hand signal to back up without locking the switch or using the proper signal intended for that movement. I always insist on having all trailing switches locked, as well as facing ones. I also noticed that the derail switches are locked with the same lever as a junction switch. By doing this you are obliged to have two holes in the front rod of the derailing switch and you lock it both closed and open. This I always avoid, and arrange that a derailing switch can only be locked when closed, and there is never a hole in the front rod to lock it when open. Thus, in the case of breaking connections, or of a pin becoming disconnected from the derailing switch, it would not be possible to get the signals for this route while the derail was open. There is one good feature about the Hartford plant, there are no selectors used in it—there being a lever for every signal, which is, I think, the proper thing.

Mr. MILES: The practice of the Michigan Central is to lock all trailing switches, but it is not insisted that such switches should be locked with a facing point lock (separate lever). We use a switch and lock movement on siding derails and switches on short leads and lock such derailing switches by locking the signals that govern them in a facing direction.

Mr. SPERRY: In the locking of trailing switches the locking sheet shows (for signal 2, for example) that it locks the detector bar which is used on a derail and on a slip switch, but the signal does not lock the bar on the trailing end of the slip; trains would pass over the slip with the trailing end unlocked. That, of course, saves manipulations. It is possible we are doing too much locking. I understand the English practice in large yards is to lock switches for regular passenger trains, but not for empty trains, the idea being that they can switch quicker by saving manipulations. The short length of cars there makes it difficult to throw a switch under a train. In locking a slip switch having a movable point frog Mr. Vernon

* By Robert W. Hunt, at the Chicago meeting of the American Institute of Mining Engineers.

* Discussion at Chicago, Jan. 12, on Mr. Rudd's paper, printed in the *Railroad Gazette* Nov. 27.

leaves off the lock rods and simply attaches the tappet for the plunger to the end of the switch rod. He takes the frog as it comes from the switch makers and hooks the tappet on the switch rod. He thinks that is all that is necessary, as, of course, the frog is very rigid. He makes a practice of using one style lock casting throughout, this being the old style inside plunger casting, and he uses it inside or outside wherever it happens to come. He also uses on switches a $\frac{3}{4}$ -in. pin with nut and cotter, as he thinks there is some danger of pins jumping out on switches. In slip switches he has an iron plate on top of every tie, so his slip switches are plated throughout the entire length. They are using very heavy 6-in. rails.

Mr. Rudd's plan shows three and four-arm signals. It might be well to discuss the advisability of so many arms.

Mr. ELLIOTT: Mr. Rudd says the lead out timbers are set in one big bed of concrete 4 ft. deep with large stone at the bottom. I do not see what is the necessity for this. Our practice is merely to run lead-out timbers outside the tower a sufficient distance to carry the cross planking and bolt the cranks to. There is no need of any foundations at all unless the location is on the opposite side of the track from the tower. We support lead-out timbers by the foundation for the wall and a floor of 8 in. plank placed on top of the lead-out timbers, which is, in my opinion, even stronger than diagonal bracing.

Our lead-out timbers are made to project 10 ft. beyond the tower and are supported at the ends. You take a bed of concrete 4 ft. deep and, say 6 ft. wide by 15 or 20 ft. long, and it is pretty expensive. Some form of bracing, I think, would answer the same purpose. Then his large piers or foundations for cranks are but 18 in. square. A crank foundation has to stand thrusts, and a square pier put in the ground presents very little surface. I think 18 x 24 or 18 x 30 a better foundation. In regard to circuits, it is enough to simply lock the derail closed. An additional relay in the long circuit adds extra resistance requiring more battery to maintain it, and should be dispensed with if possible.

Mr. MILES: Mr. Sperry brought up a question as to the use of so many signal arms on some of the signals. The rules that the committee has submitted to the club limit the number of blades to three at junction points and two at other points, junction points being understood as meaning the junction of two main lines. Where three blades are used at the latter point the lower blade governs movements on to sidetracks. The practice on some roads is to use four and even five blades. The Michigan Central has one plant where three blades are used; the top arm governs main line movements; the middle arm governs movements to the right, and the

Size of steam ports, H. P., 20 in. x $2\frac{1}{2}$ in.; L. P., 23 in. x $2\frac{1}{2}$ in.
Size of exhaust ports, H. P., 20 in. x 3 in.; L. P., 23 in. x 3 in.
Size of bridges, 19 in.

Valves.

Kind of slide valves, Allen-Richardson
Greatest travel of slide valves, 6 in.
Outside lap, 1 in.
Inside clearance of slide valves, 1 in.
Kind of valve stem packing, Jerome metallic

Wheels, Etc.

Diam. of driving wheels outside of tire, 55 in.
Material of driving wheels centers, American cast steel.
Tire held by, shrinkage.
Driving box material, Cast steel on main only, balance steered cast iron
Diam. and length of driving journals, Inter. F. & B. 8 in. on main only x 10 in.
Diam. and length of main crank pin journal, Side Rod 7 in. diam. x 5 in. Main 8 in. diam. x 6 in.
Diameter and length of side rod crank pin journals, Inter. 5 in. diam. x 5 in. F. & B. 5 in. diam. x 3 in.
Engine truck kind, 4-wheel, swing bolster.
Journals, 6 in. diam. x 11 in.
Diam. of engine truck wheels, 28 in.
Kind, Steel tired, cast-iron spoke center.

Boiler.

Style, Extended wagon top.
Outside diam. of first ring, 72 in.
Working pressure, 200 lbs.
Material of barrel and outside of firebox, Carbon steel.
Thickness of plates in barrel and outside of firebox, $\frac{1}{2}$ in., $\frac{3}{4}$ in., $\frac{1}{2}$ in., $\frac{3}{4}$ in., $\frac{1}{2}$ in. and $\frac{3}{4}$ in.
Horizontal seams, Butt joint, sextuple riveted, with welt-strip inside and outside.
Circumferential seams, Double riveted
Fire box, length, 120 in.
" width, 42 in.
Fire box, depth, Front, 77 in.; back, 73 in.
" material, Carbon steel
" plates, thickness, sides, $\frac{1}{2}$ in.; back, $\frac{3}{4}$ in.; crown, $\frac{3}{4}$ in.; tube sheet, $\frac{3}{4}$ in.
" water space, Front, 4 in.; sides, 3 in. to 4 in.
" above grates; back, 3 in. to 4 in.
" crown staying, Radial stays $\frac{1}{4}$ in. diam.
" stay bolts, Sligo iron 1 in.
Tubes, material, Charcoal iron No. 12 W. G.
" number of, 332
" diameter, 2 in.
" length over tube sheets, 14 ft. 0 in.
Fire brick, supported on, Water tubes, R. R. Co.'s style
Heating surface, tubes, 2,721.6 sq. ft.
" water tubes, 15.3 sq. ft.
" fire box, 28.5 sq. ft.
" total, 2,943.41 sq. ft.

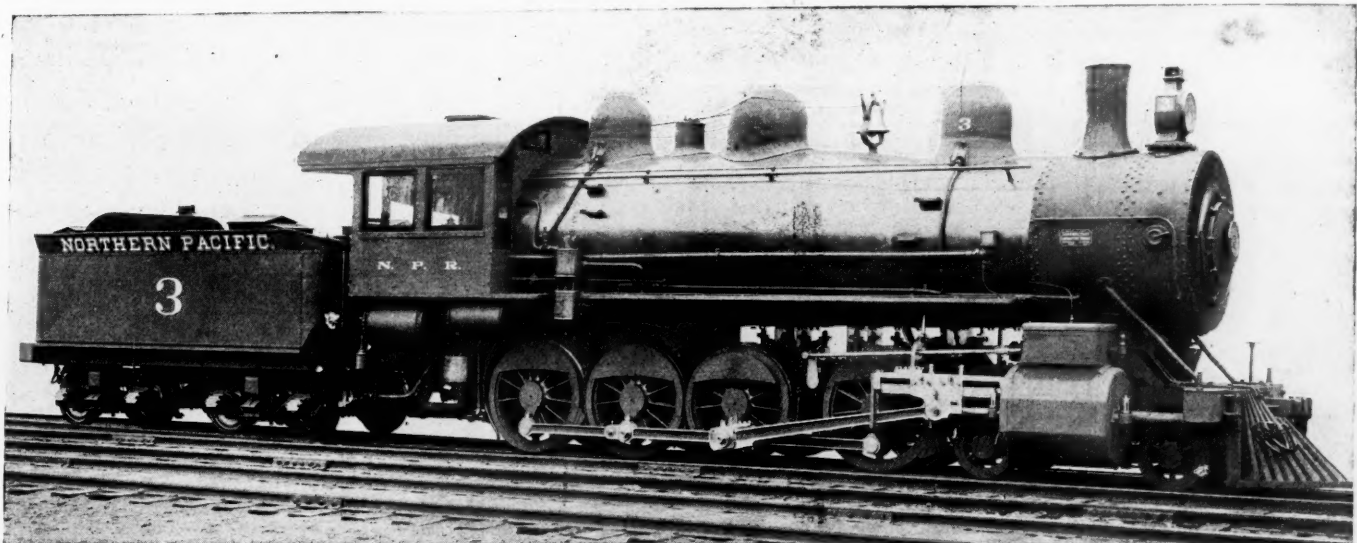
that direction. Beside these, there was a collection of photographs of modern locomotives, built by the Cooke Locomotive Works, and photographs showing the particulars of construction on both electric and steam roads.

Because of their historical interest, the models of the Stevens battery and the first twin-screw ferryboat on the Hudson River, both the works of Col. John Stevens, were objects of much curious interest. The engineering features connected with the construction of this old war vessel are probably well known and require no comment.

The small room showing the X-ray apparatus made by Messrs. Jackson and Aylesworth was continually crowded, and the excellence of the fluoroscope enabled many to obtain for the first time a view of the bones in the hand.

Twelve members of the faculty made separate exhibits. President Henry Morton and Prof. Alfred Mayer took a great interest in explaining the apparatus and models for scientific investigation. In the department of mechanics Prof. J. B. Webb explained many of the principles by means of the apparatus located in his lecture room, while in the electrical laboratory the poly-phase induction motor made by Instructor A. F. Ganz was the center of a group of observers, who took pleasure in closing the switch, which set the apparatus in motion. Professor Wood's rock drill, familiar to almost every graduate of the Institute, as well as to many of the older graduates of the University of Michigan, was taken from its grave in one of the cases in the Library, and when compressed air was admitted to the working cylinder, it hammered away for awhile with much of its old-time vigor. A reference to the faculty exhibit would be incomplete without a mention of Professor Bristol's recording instruments, which were shown in operation. These instruments have found a ready market and may be seen in all parts of the country. The other apparatus shown by the alumni should be mentioned, but we must pass on to speak of some of the work of the graduates.

A 20-H. P. gas engine, invented by Mr. L. H. Nash and



Twelve-Wheel Compound Locomotive—Northern Pacific Railroad.
Built by the SCHENECTADY LOCOMOTIVE WORKS, Schenectady, N. Y.

lower arm movements to the left. The Superintendent on our road seems to favor this plan at large plants where there are a great many tracks and it is necessary to give many crossover movements. Before deciding on the rules I think it would be well to thoroughly discuss the question of the number of blades to be used on signal poles.

Schenectady 12-Wheelers for the Northern Pacific.

We published last November a brief description of the 12-wheel compound locomotives built by the Schenectady Locomotive Works for the Northern Pacific. Four of these have been built for mountain service on a grade of 116 ft. per mile, 17 miles long. We are able now to give a general view from a photograph of one of these, and the descriptive specification follows. The enormous heating surface of these engines, namely, 2,943.41 sq. ft., will be observed. It is probable that these are the most powerful engines ever built for normal road service, although not the heaviest. They are expected to develop a drawbar pull of from 35,000 to 40,000 lbs. and 1,200 H. P. for three hours at a time at 16 miles an hour. In a trial of one of these hauling a train east of Schenectady over the heavy grade of the New York Central, 1,190 H. P. was indicated at 15 miles an hour. In these trials the engine said to have taken 58 loaded cars up a 60-ft. grade three miles long.

TWELVE-WHEEL COMPOUND LOCOMOTIVE.

General Dimensions.

Gage, 4 ft. 8 in.
Fuel, Bituminous coal.
Weight in working order, 186,000 lbs.
Weight on drivers, 150,000 lbs.
Wheel base, driving, 15 ft. 6 in.
" rigid, 15 ft. 6 in.
" total, 26 ft. 4 in.

Cylinders.

Diam. of cylinders, H. P., 23 in.; L. P., 34 in.
Stroke of piston, 30 in.
Horizontal thickness of piston, 4 in. and 5 in.
Diam. of piston rod, 3 in.
Kind, packing, Cast-iron rings sprung in.
rod packing, Jerome metallic

Grate surface, 35 sq. ft.
" style, Rocking, R. R. Co.'s style
Ash pan, Sectional
Exhaust pipes, Single; high
nozzles, 5 in. and 5 in. dia.
Smoke stack, inside diameter, 18 in. at top, 16 in. near bottom.
" top above rail, 14 ft. 10 in.
Boiler supplied by, Two Sellers improved Class M. No. 1014 injectors

Tender.

Weight, empty, 36,300 lbs.
Wheels, number of, 8 cast-iron plate wheels
diam, 33 in.
Journals, diam. and length, 4 in. diam. x 8 in.
Wheel base, 15 ft. 3 in.
Tender frame, 10-in. steel channels
trucks.
4-wheel, channel iron, center bearing F. & B.
Additional side bearings on back truck
Water capacity, 4,000 U. S. gals.
Coal, 7 1/2 (2,000 lbs.) tons
Total wheel base of engine and tender, 53 ft. 8 in.
length, 62 ft. 8 in.
Engine provided with—
American brake on all drivers, operated by air; Le Chatelier water-brake on cylinders.
Westinghouse auto. airbrake on tender and for train; 9 1/2-in. pump.
Westinghouse air signal.
Three 3-in. Ashton safety valves.
Magnesia sectional covering on boiler, dome and cylinders.
Dean's sand-feeding device.
Kewanee reversible brake beams.
McIntosh blow-off cock.

Twenty-five Years of Mechanical Engineering.

The twenty-fifth anniversary of the Stevens Institute of Technology, which was celebrated last week, was an affair of more than passing interest. Many social features were enjoyed by the friends of the Institute, while the extensive exhibit was an object lesson to young engineers and of much interest to the general observer. A large number of the machines were shown in operation, so that even those unacquainted with the mechanics of the different apparatus, found much that was attractive. The large exhibit of photographs and drawings in the Library of the Institute gave an idea of the work accomplished by the students and graduates in

made by the National Meter Company, was exhibited in combination with a dynamo. The shafts of the engine and dynamo are in line and coupled together by a friction clutch. This clutch is operated by a shaft governor placed in a fly-wheel on the shaft of the dynamo, so that when the dynamo begins to run over its normal speed, it is for an instant disconnected until the governor on the engine, which regulates the gas supply, can operate to bring the engine to the proper speed, when the clutch is again thrown into gear. By this means it is claimed the speed of the dynamo can be so controlled that it will furnish a steady current for incandescent lighting. The engine is the double-cylinder vertical type with the usual four-stage cycle. Two engines of this type of 200 H. P. each are now being made to be operated by producer gas and will be direct connected to the dynamos for electrical work. With the gas at \$1.25 per 1,000 cubic ft. it is claimed that these engines will furnish power for 2 1/2 cents per horse-power hour, and that the cost of lighting by incandescent lamps of 16 candle-power will be reduced to one-quarter of a cent per lamp per hour.

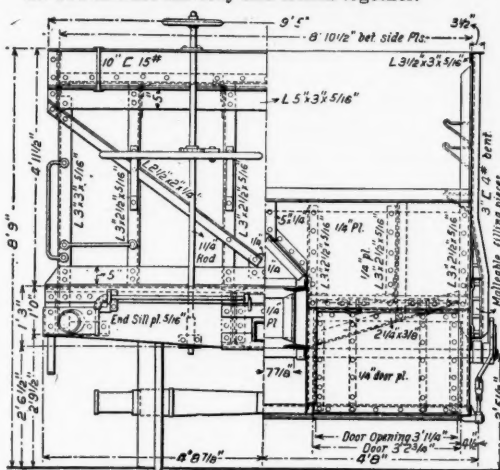
Mr. E. A. Uehling showed his pneumatic pyrometer and gas composimeter in operation. These were placed about 100 ft. from the boiler in the basement and the pyrometer registered the temperature of the furnace and the composimeter showed the per cent. of CO₂ in the escaping chimney gases.

Mr. H. A. Wagner showed among other electrical machines a single phase electric motor which was started as a continuous current machine and changed to a single phase alternating current when the speed was increased to several hundred revolutions per minute.

Mr. Gus C. Henning made an interesting exhibit of the new instruments for recording the conditions which occur in a piece of metal while in the testing machine. These are of extremely simple character and are entirely new. We expect to publish a description of one of these instruments in a subsequent issue.

angles and will extend to, and be riveted to, the angles on the opposite I-beam. Riveted to these cross angles will be a plate 5 in. \times $\frac{1}{4}$ in., bent at the ends, and placed across the center. This plate to have a hole at its center $2\frac{1}{2}$ in. in diameter, to receive the center pin.

Commencing at a point about 13 in. from the center of the I-beam and extending to an equal distance from the center of the opposite I-beam, will be a plate 15 in. x $\frac{3}{4}$ in. This will be riveted to the lower angles of the body bolster and to the I-beams and cross angles between same and have a hole $2\frac{1}{2}$ in. diameter to receive the center pin. To this plate will be riveted the top center plate of truck. A center pin 2 in. in diameter, having $\frac{1}{2}$ in. cotter will connect the body and trucks together.



Half End Elevation. Half Transverse Section.
Steel Hopper Car.

At the end of the bolster a bracket angle $3\frac{1}{2}$ in. x 3 in. x 5-16 in. will be riveted to the angle at the bottom of the side sill. A bar 1 in. thick will be riveted to the lower angle flanges of bolsters to form side bearings and located to suit the corresponding bearings on truck.

Center Transom.—Commencing at one end, two angles 3 in. x 2½ x 5-16 in. will be riveted to the side plates of car and will extend to the angle at the top of the side plates, the inside flanges spaced a sufficient distance apart to receive a ¼-in. plate. Rivets to pass through channel side brace.

one at the center. These channels will be bent at the bottom to accommodate the flange of the bottom angle of the side sill, and will be straight from that point to the top of the car. In addition to this there will be six 3-in. channels, each weighing 4 lbs. per ft., extending the full height of the car side, and two similar short channels between the body bolster and the end. Those extending the full length will be bent at the lower ends to project over the flanges of the two lower side-sill angles. To fill the space from the commencement of the bend to the bottom, suitable malleable castings will be used. All to be firmly riveted to the side plates.

On the top of the plate and channels will be placed an angle 3½ in. x 3 in. x 5-16 in. with the vertical flange inside of the side plate. This will form the cap and will be riveted to the side plates and channels.

A brace of 3 in. x 3 in. x 5-16-in. angle will extend from a piece of angle 6 in. x 3½ in. x ⅝ in. riveted to the corner end brace, to a plate at the top of the body bolster and be riveted thereto.

End Bracing.—Riveted to the top of the end sill cap will be an angle 5 in. x 3 in. x 5-16 in. extending the entire length of the sill. The rivets passing through cap at I-beams and side angles will assist in securing this. The back of this angle will be 9 in. from the outside face of the face plate. At each corner will be located an angle 3 in. x 3 in. x 5-16 in. which will extend from the bottom angle of side sill to the side angle of flooring.

At the top of each I-beam, flange inward with back $\frac{3}{4}$ in. outside of outer edge of I-beam will be an angle 3 in. x $2\frac{1}{2}$ in. x 5-16 in. placed in a vertical position. At an intermediate point between this and the corner will be another angle 3 in. x $2\frac{1}{2}$ in. x 5-16 in. placed in a vertical position. Each of the vertical braces will extend to the floor line and will be secured at the top by an angle 5 in. x 3 in. x 5-16 in. extending the width of the car, and will also connect with the floor angles described under "Floor." A piece of angle 3 in. x 3 in. x 5-16 in. will be riveted to the top of each corner brace and connect same with outside of side plate and top end bracing. Extending across the end at the top will be placed a 10-in. channel, weight 15 lbs. per foot. This will form the cap for the end, and must be made to receive the rivets passing through the floor plate. Riveted to the angle placed on the end sill cap will be a plate $\frac{1}{4}$ in. thick by 6 in. wide, this to be placed directly at the center. A diagonal angle brace $2\frac{1}{2}$ in. x 2 in. x $\frac{1}{4}$ in. will extend from this plate to each top corner, extending directly under the top cross angle.

Riveted to the top of the I beams will be a short piece of angle $2\frac{1}{2}$ in. x $2\frac{1}{2}$ in. x $\frac{1}{4}$ in. connecting with $\frac{1}{4}$ in. plate which will act as a support for bottom of vertical braces. A piece of $\frac{1}{4}$ in. round will be secured to the flanges of the channel at the top and be riveted on each end; these to be located about 15 in. from each corner of the car to form handholds.

Corner Angle Braces.—Riveted to the I-beams on top,

angle 3 in. x $2\frac{1}{2}$ in. x 5-16 in. placed in a sloping position. At the I-beam, an angle 3 in. x $2\frac{1}{2}$ in. x 5-16 in. will be riveted to the angles placed on top and bottom of the I-beam and connected to the vertical angle of the center transom by 5-16 in. plate.

Intermediate between the side plate and I-beam will be an angle 3 in. x $2\frac{1}{2}$ x 5-16 in., connected to the intermediate angle of the center transom by a $\frac{1}{4}$ -in. gusset plate, all three angles having their top flanges placed on the same slope. Riveted to these angles at the drop door opening will be three bent connecting plates 5-16 in. thick, one at each floor angle, forming an even surface across the drop door opening. To these will be riveted a framing angle 4 in. x 4 in. x $\frac{3}{8}$ in., to which the drop doors will be hung. Placed on top of this angle, clear across the door opening, will be $3\frac{1}{2}$ x 5-16 in. filler plate. The whole will then be covered by a $\frac{1}{4}$ -in. floor plate, extending from side to side of car and spliced at center by 5 in. x $\frac{1}{2}$ -in. plate. Floor plate to be cut at the center to pass over the longitudinal ridge and securely riveted to the sloping angles by $\frac{3}{8}$ -in. rivets.

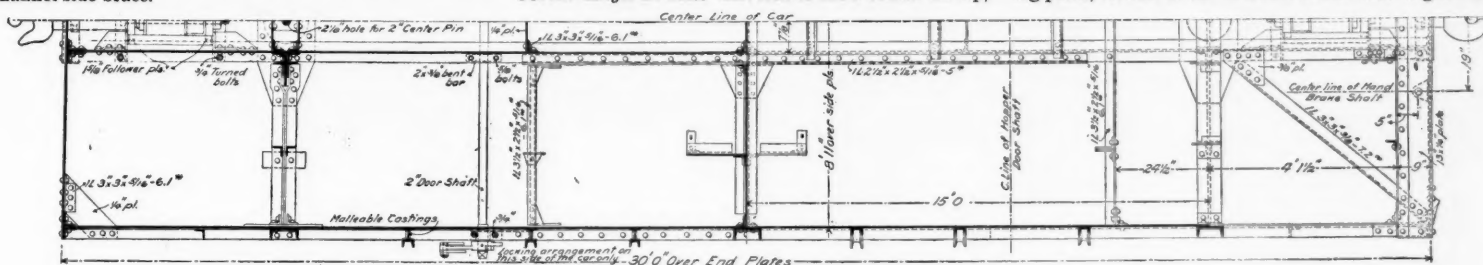
Extending across the car, on top of the top cross angles of the center transom, will be a piece of white oak, so shaped to form the cap of the ridge. This will be secured in position by $\frac{3}{8}$ -in. lag screws through the extending flanges of the cross angles of the center transom.

Floor. Will consist of six angles extending from the top end bracing to the drop door openings. The side angles will be 3 in. x 2½ in. x 5-16 in. Center and intermediate angles will be 3½ in. x 2½ in. x 5-16 in. The two side angles will be riveted to the side plates of the car. The center angle will be riveted to the end bracing at the top and further secured by a ¼-in. plate, also riveted to the bracing. The intermediate angles will be secured to the intermediate end braces in the same way. The center and intermediate angles will also be supported at the body bolster by a piece of angle and bent plate riveted to the cross angles of the bolster.

Extending across the car on the top of the I-beams, at the point where the floor angles meet the I-beams, will be a cross angle $3\frac{1}{2}$ in. x $2\frac{1}{2}$ in. x 5-16 in. This will be riveted to the I-beams and supported at the ends by a piece of angle 5 in. x 3 in. x 5-16 in. riveted to the side plates. To support the intermediate floor angle two angles 5 in. x 3 in. x 5-16 in. will be riveted to this cross angle.

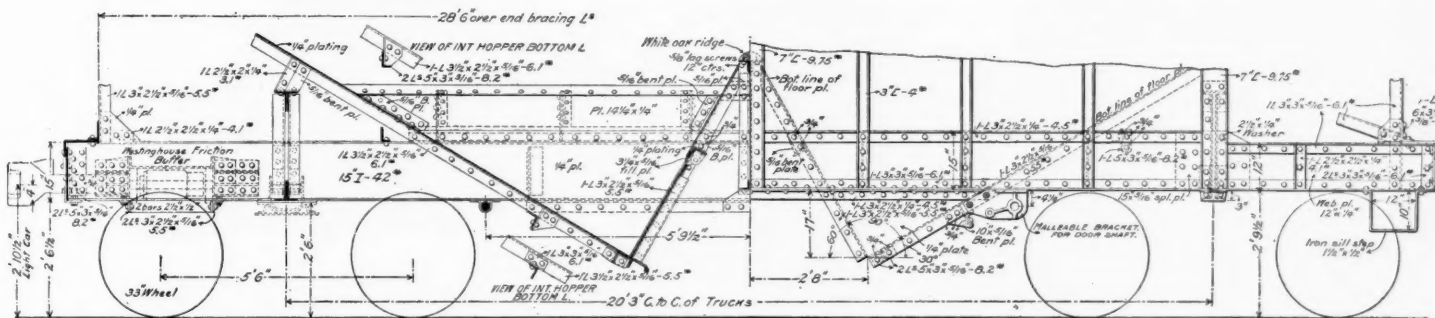
The center angles will be supported by two angles $2\frac{1}{2}$ in. x $2\frac{1}{2}$ in. x 5-16 in.; one placed on top of the I-beam, flange up, and one on the bottom of the I-beam, flange down. The flanges of these angles will extend $\frac{1}{2}$ in. outside the flange of the I-beam. These angles will extend from the meeting point of the floor angles with the I-beams to the meeting point at the opposite end.

The intermediate floor angle will be further supported by an angle 3½ in. x 2½ in. x 5-16 in. extending from the lower flange of the center floor angle to the side of car, supported at each end by a 10 in. x 5-16 in. bent connecting plate, riveted to the side and center floor angles. An



Half Sectional Plan:

Half Plan.



Half Sectional Elevation.

Half Side Elevation.

Underframing for Steel Hopper Car.

At the I-beam a plate 5-16 in. thick will be bent at one end and riveted to an angle $2\frac{1}{2}$ in. x $2\frac{1}{2}$ in. x 5-16 in., which will be riveted to the lower flange of the I-beam. At a point about 8 in. above the lower edge of the side plate, two angles 3 in. x $2\frac{1}{2}$ in. x 5-16 in. will extend from the side angles to the I-beam and be riveted to the bent plate. These to have inside flanges up and spaced to receive a $\frac{1}{4}$ in. plate.

At the I-beam, an angle 6 in. x 3½ in. x % in. will be placed vertically and riveted to the web of the I-beam, wide flange out. An angle 3 in. x 2½ in. x 5-16 in. will be riveted to this, that will extend from the plate below to the cross angles at the top of the transom. A short angle 3 in. x 2½ in. x 5-16 in. will extend from the top of the angle riveted to the web of I-beam, to the cross angles at the top.

At an intermediate point between the I-beam and side plate, will be two angles $2\frac{1}{2}$ in. x $2\frac{1}{2}$ in. x $\frac{3}{4}$ in. placed vertically, spaced to receive a $\frac{1}{4}$ in. plate. Placed across the top, extending the entire width between the vertical angles, riveting each side plate, will be two angles 3 in. x $2\frac{1}{2}$ in. x 5-16 in. These will also be spaced to receive a $\frac{1}{4}$ in. plate. The vertical angles will be bent where necessary to receive the flanges of the cross angles. A $\frac{1}{4}$ -in. web plate will be placed between the top and bottom angles and be securely riveted to each. This plate will extend the entire depth of the transom, and from the side plate to the I-beam.

Side and Side Braces.—The side will consist of two plates $\frac{1}{4}$ in. thick, extending from the center of the body bolsters to the center of the center transom, and will extend from the lower face of the bottom side sill angle to the angle at the top of car body. A plate also $\frac{1}{4}$ in. thick will extend from the center of the side channel at body bolster to the end of car. This plate will only extend from the side floor angle to the top angle, to both of which it will be riveted. These side plates will be supported in position by three 7-in. channels, each weighing 9½ lbs. per ft., one located at each body bolster and

directly in front of the body bolsters, will be gusset plates $\frac{3}{8}$ in. thick. Extending from these plates to the ends of the ends and side sills will be angles 3 in. x 3 in. x $\frac{3}{8}$ in.; these angles will be riveted to the cross angles and caps at end sills and to plates at I-beam ends. At one end of car brake cylinder and auxiliary reservoir will be supported by the above angles, and secured by necessary fixings to bolsters and sills.

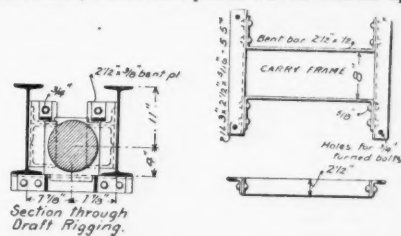
Center Bracing and Longitudinal Ridge.—Riveted to the web of the I-beams at the center of car will be two angles 3 in. x 3 in. x 5-16 in., spaced a sufficient distance apart to receive a $\frac{1}{4}$ in. plate. Riveted to these angles will be a 10 in. x $\frac{1}{4}$ in. plate extending from web to web of the I-beams. At an equal distance each way from center of car one angle 3 in. x 3 in. x 5-16 in. will be riveted to the web of each I-beam and connected by a plate 10 in. x $\frac{1}{4}$ in., extending the width of the space between the webs of the I-beams.

Riveted to the side plate forming the pocket and the angle secured to the outer edge of the I-beam will be a plate $3\frac{1}{2}$ in. x $\frac{1}{2}$ in., bent at the top and extending between the end and center floor plates. Across the I-beams at the top, and riveted thereto, will be three pieces of angle $2\frac{1}{2}$ in. x $2\frac{1}{2}$ in. x 5-16 in. Riveted to each of these angles will be a plate $\frac{1}{2}$ in. thick, to which will be riveted two angles $2\frac{1}{2}$ in. x $\frac{3}{4}$ in. x $\frac{1}{4}$ in. placed to give a slope of 45 deg. with the horizontal. To these angles and forming each side of the slope will be riveted a plate $1\frac{1}{2}$ in. x $\frac{1}{2}$ in., which will extend between the end floor plates. These plates will rest at bottom on bent plates, and be connected to end and center floor plates by 5-16 in. bent plates.

Bent over top of plates and angles forming this center ridge and securely riveted thereto will be a plate 8 in. x $\frac{1}{4}$ in., extending between the end floor plates and forming a cap for the whole. The supports described for this center ridge are for one-half and are repeated on the other side of the center transom.

Cross Ridge.—Riveted to the side plate will be an

angle 3 in. x 3 in. x 5-16 in. will be riveted to the intermediate floor angle and this cross angle. At the lower ends of the floor angles will be riveted connecting angles 3 in. x 3 in. x 5-16 in. which will be riveted a framing angle 4 in. x 4 in. $\frac{3}{8}$ in. that will extend the full width of the door opening. The floor framing angles will be covered by $\frac{1}{4}$ -in. plates in sections extending transversely between car sides, and longitudinally between framing angles at door openings and top end channel brace, where floor plates will be turned up and



Section Through Draft Rigging—Steel Hopper Car.

riveted Rivets connecting plating to floor angles to be $\frac{5}{8}$ in. in diameter. To cover the opening at the sides of the pockets, between the I-beams and side sills, a $\frac{3}{4}$ -in. plate will be riveted extending on the I-beam from the angle at the top of the I-beam to the center floor angles, and on the side sill side, from the angle riveted to the bottom side sill angle to the side floor angles; to all of which the plates will be securely riveted.

Door Drops.—The doors will be four in number, hung in pairs and attached to the cross framing angles at the bottom of the cross ridge by suitable hinge bracket.

made of malleable iron. The hinges will be $1\frac{1}{4}$ in. x $\frac{1}{2}$ in., having an eye on one end for $1\frac{1}{4}$ -in. turned pin, bent at the other end and riveted to a 5-in. bulb angle weighing 10 lbs. per foot, which will connect the two doors together and extend sufficiently to receive the bottom ends of door operating bars, the ends of the bulb on this angle being swaged in gudgeon form to receive these bars. Riveted to this bulb angle will be two bent plates $2\frac{1}{4}$ in. x $\frac{1}{2}$ in. at each door, which will form supports for the end of the angles 3 in. x $2\frac{1}{2}$ x $\frac{1}{2}$ in., which extend from the bulb angle to a bar $2\frac{1}{4}$ x $\frac{1}{2}$ in. placed across the tops of the doors. From this plate the hinges will be bent $\frac{1}{2}$ in. so that the whole will form an even surface which will be covered with a $\frac{1}{2}$ -in. plate, securely riveted to the hinges and angles by $\frac{1}{2}$ -in. rivets. The hinges will be secured to the brackets by $1\frac{1}{4}$ -in. turned pins having $\frac{1}{2}$ -in. washers and $\frac{1}{4}$ -in. split cotters.

Each pair of doors will be operated by a shaft 2 in. in diameter, placed across the car underneath the framing. Shaft to be $2\frac{1}{4}$ in. in diameter at side sill bearing, squared at one end $2\frac{1}{4}$ in. in length to receive an operating wrench and supported by 2 in. x $\frac{1}{2}$ in. carriers secured to the bottom flange of I-beams by two $\frac{1}{2}$ -in. bolts in each, and by suitable malleable brackets placed

The door shafts at side sill bearings and folding cam connections will be turned to $2\frac{1}{4}$ in. diameter, the bearings and cam levers being truly bored out to receive same and each lever secured in the required position by the tapered pin passing through lever and shaft.

For connecting the cam links to operating rods and levers $1\frac{1}{4}$ in. turned bolts will be used having countersunk heads and nuts secured by cotters. The lower end of operating rods connecting with gudgeon on end of bulb angle at bottom of doors will be secured thereto by $\frac{1}{4}$ -in. washer and 5-16 in. split cotter.

General.—All malleable castings not otherwise specified, to be of the National Malleable Casting Co. or Pittsburgh Malleable Iron Co.'s make. All workmanship must be first-class.

All holes in the several parts forming the car body may be punched, except those passing through the drawbar stops, drawbar stop re-inforce pieces, I-beams at the point where drawbar stops are connected, and where the body bolsters, center transom and end sills connect with I-beams, where they must be drilled from metal templates or punched and reamed. When punched and reamed, the holes must be punched 3-16 in. less than the finished size and reamed subsequent to all parts being assembled. Great care must be taken in all of the parts mentioned

freight, wrecking the caboose and 3 cars; conductor injured.

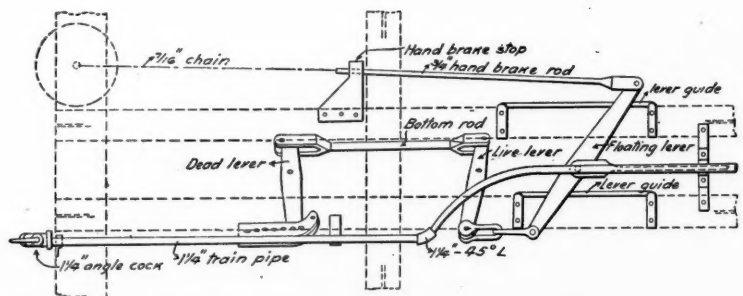
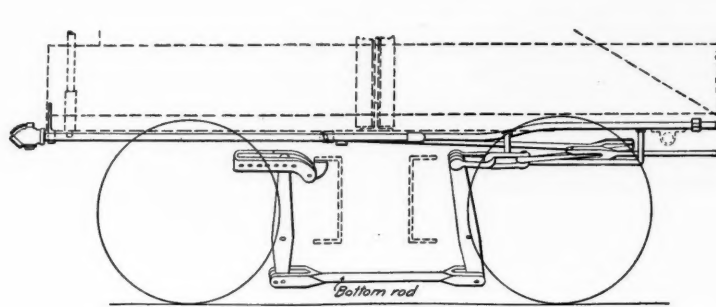
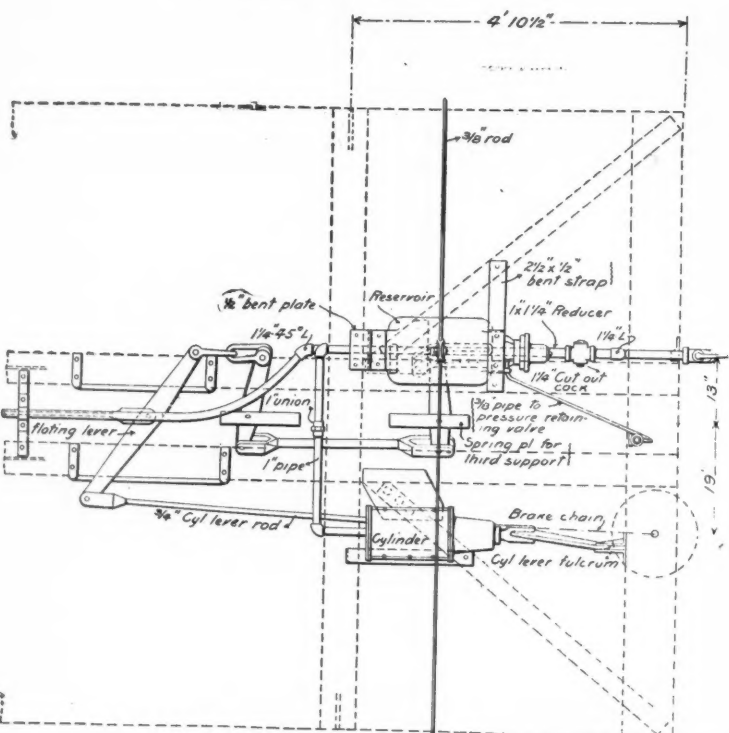
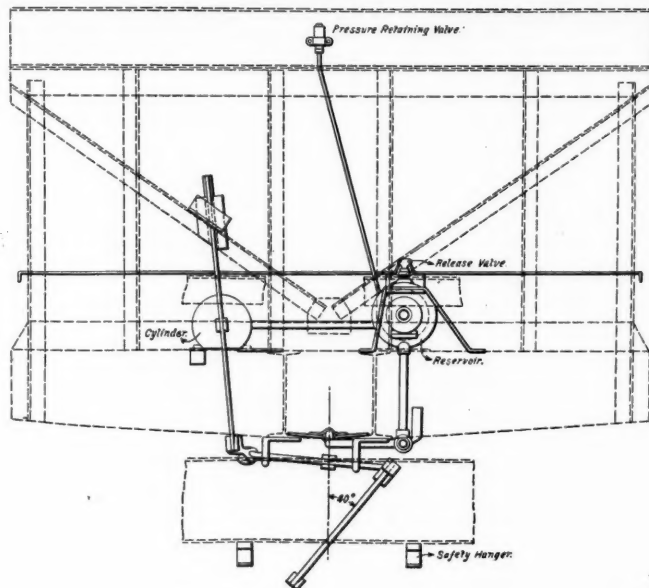
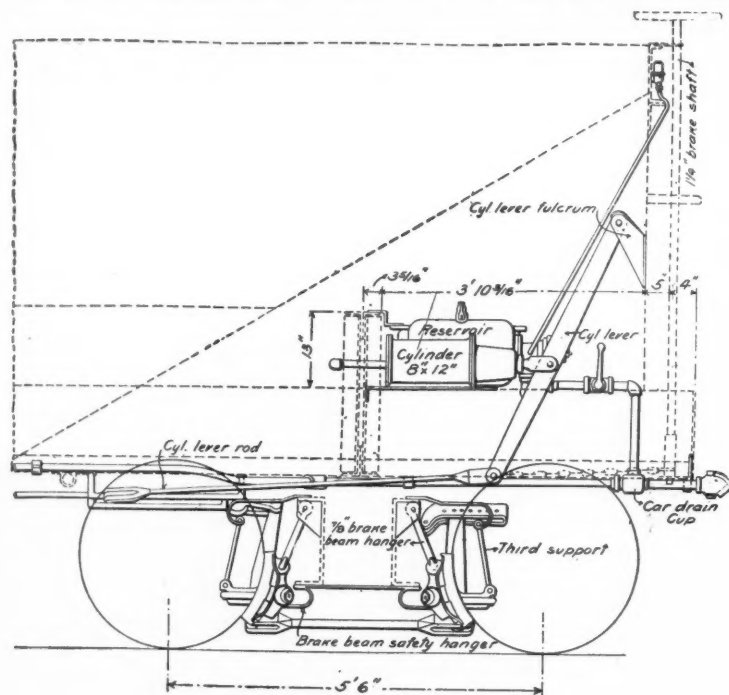
13th, on Union Elevated road, at 40th street, Brooklyn, N. Y., an empty engine ran into the rear of a preceding passenger train, doing slight damage. Three passengers were injured.

13th, on Fitchburg road, at South Ashburnham, Mass., a passenger train ran into the rear of a preceding freight, damaging several cars. The engineman and one passenger were injured.

14th, on Louisville & Nashville, at Sinking Creek, Ky., a freight train, taking water, was run into at the rear by a following freight, wrecking several cars. Two drivers were fatally injured and the engineman was hurt.

15th, on Louisville & Nashville, at Gallatin, Tenn., a passenger train standing at the station was run into at the rear by a freight train which approached at uncontrollable speed, badly damaging the passenger cars. Two passengers were injured.

19th, 10 p. m., on Southern Pacific, at Oakland, Cal., the Sunset limited express ran into the rear of a local passenger train, doing considerable damage. A fireman was killed by jumping off, and one passenger was injured. The express train ran past an automatic



Brake Rigging for 100,000 Lbs. Capacity Steel Hopper Car—Pittsburgh, Bessemer & Lake Erie.

under side sill angles and bolted thereto by $\frac{1}{2}$ -in. bolts, having nuts secured by cotters. Inside the squared end of the shaft and located to clear side sill angles, will be placed a folding cam consisting of malleable lever and steel links, lever having a lug extending on the upper side to take detent in upper end of door operating rods when doors are closed. Cast on the malleable lever at locking end of door shaft, will be a form of ratchet with which a suitable dog will engage for preventing rotation, dog to be pivoted to the bearing bracket at side sill, and when in position, locked by a suitable pawl secured to side sill at its upper end. Extending from the end of the link portion of the folding cam to, and connecting with, the swaged end of the bulb angle connecting the two doors, will be a bar $1\frac{1}{4}$ in. in diameter, having a $1\frac{1}{2}$ in. turnbuckle near its lower end, and at its upper end, shaped to engage with the projecting lug on the lever. The lever will be secured to the door shaft by a $\frac{1}{2}$ -in. tapered pin, turned and fitted.

On the opposite end of the door shaft, a similar folding cam will be placed, except that no locking attachment will be applied. The folding cam and operating rods must be of sufficient length to permit of doors opening as far as possible without striking each other at any part.

above to know that a perfect correspondence of the holes in the parts to be connected is brought about. Wherever bolts are used for connecting pieces to beveled flanges of rolled sections, heads of same must have a corresponding bevel to insure perfect bearing. All bolts must have nuts secured by cotters.

Train Accidents in the United States in January.

COLLISIONS.

REAR.

1st, on New York Central & Hudson River, near Schenectady, N. Y., a freight train ran into the rear of a preceding freight, wrecking several cars, which took fire and were burned up; one fireman and one brakeman killed.

6th, on Manhattan elevated, Third Avenue Line, at 34th street, New York City, a passenger train ran into the rear of a preceding passenger train, doing slight damage; one passenger injured.

10th, on Atchison, Topeka & Santa Fe, at Davidson, Tex., a freight train ran into the rear of a preceding

signal indicating danger. The engineman of the express admits passing the automatic signal at danger, his excuse being that the semaphore signal at a junction a short distance beyond was plainly visible to him and indicated that his track was clear. The local train had been held at this junction, and while it was so waiting it was struck. Its flagman had gone back about 100 ft. The signalman in a cabin some distance back of the point of collision telephoned to the signalman at the junction informing him that the express train was on its way; this he did because the junction signalman was new at the work, having been in that cabin only one night before. But the telephone message was received before the local train arrived, and the switch and signal were set for the main line; that is, for the express; then when the local appeared, the signalman had to go outside his cabin to take the electric lock off his lever in order to set the switch for the branch, the local train having applied this lock by means of a track circuit.

22d, On Houston & Texas Central, at Benchley, Tex., a freight train ran into the rear of a preceding freight, doing considerable damage; 4 employees injured. There was a dense fog at the time.

And 14 others on 14 roads, involving 1 passenger train and 21 freight and other trains.

BUTTING.

2d, on New York Central & Hudson River, at Unionville, N. Y., a southbound passenger train entering the sidetrack to make way for a northbound passenger train was run into by the latter, badly damaging both engines. One of them was overturned; one engineman injured.

9th, on Atchison, Topeka & Santa Fe, at Hazlett, Tex., a northbound freight train standing at the station was run into by a southbound freight, making a bad wreck. One engineman and one brakeman were killed and two other trainmen were injured.

18th, on Chicago & North Western, at Chester, Wis., butting collision of passenger trains; an employee was injured.

26th, 5 a. m., on Northern Pacific, at Lake, Wash., butting collision between westbound passenger train No. 1 and eastbound passenger train No. 2, badly damaging both engines and both mail cars. One fireman was injured. There was a dense fog at the time, and it is said that the engineman of No. 1 mistook the whistling post for the mile board.

28th, 9 p. m., on Buffalo, Rochester & Pittsburgh, at Leroy, N. Y., butting collision between a freight train and a snow plow, badly wrecking the plow and both engines; 7 cars were damaged. One conductor and one brakeman were killed and 5 other trainmen were injured.

And 6 others on 6 roads, involving 3 passenger and 10 freight and other trains.

CROSSING AND MISCELLANEOUS.

6th, on Baltimore & Ohio, near Terra Alta, W. Va., a freight train coming out of a sidetrack was run into by another freight, wrecking several cars. A fireman and one brakeman were killed.

10th, on Great Northern, near Butte, Mont., a switching engine, carrying a physician to a bridge where some workmen had been hurt, collided with a freight engine. The physician was thrown off and badly injured.

16th, on Pennsylvania & Erie, at Stewart's, Pa., collision of freight trains, fatally injuring one trainman.

16th, on Philadelphia & Reading, near Skillman, N. J., local passenger train No. 560, entering a sidetrack, was allowed to run too far and fouled the main track just as it was overtaken by a following fast express train No. 524. Engine of local train was derailed, but not badly damaged. The tanks of both engines destroyed and engine of train No. 524 upset on westbound track. The combined baggage and mail car of local train was upset

The wreck took fire from the stoves in the cars, but the flames were soon extinguished.

27th, on Southern Pacific, at Gregory, Cal., a freight train was derailed, presumably by a defective frog, and the engine and 8 cars were wrecked. The fireman and a man riding on the train were injured, the latter fatally.

29th, on Savannah, Florida & Western, near Callahan, Ga., a freight train was derailed on a trestle which had been weakened by fire, and 9 cars fell to the ravine below.

30th, 3 a. m., on Canadian Pacific, at Lowelltown, Me., a passenger train was derailed, presumably by spreading of rails, and 4 cars fell down a bank. One passenger and 2 postal clerks were injured.

And 8 others on 7 roads, involving 4 passenger and 4 freight and other trains.

DEFECTS OF EQUIPMENT.

12th, on Atchison, Topeka & Santa Fe, near Sands, N. Mex., a stock train was derailed by the breaking of the flange of a wheel of a stock car and 11 double-deck cars of sheep were wrecked, 9 of them falling down a bank. About 1,700 sheep were killed and about 1,100 were saved.

And 13 others on 12 roads, involving 1 passenger train and 13 freight and other trains.

NEGLIGENCE IN OPERATING.

23d, on Pittsburgh & Western, near Shipperville, Pa., a passenger train consisting of an engine and 5 cars was derailed on a high trestle, and the whole train fell about 70 ft. to the shallow stream below. Four trainmen were killed or fatally injured and 5 passenger and one trainman were injured. The derailment is said to have been due to excessive speed, the air brakes having "failed to work" on a descending grade.

And 6 others on 6 roads, involving 1 passenger train and 5 freight and other trains.

UNFORESEEN OBSTRUCTIONS.

3d, 2 a. m., on Missouri Pacific, near New Haven, Mo., a freight train was derailed at a washout and the engine and 13 cars were wrecked. The engineman, fireman, one brakeman and one tramp stealing a ride were killed. Another tramp was injured. The engine fell into the Gasconade River and the bodies of the men upon it were badly scalded. A train had passed over this track in safety about one hour before, and section men on a hand car had also been over the road a short time prior to the accident.

3d, on Fort Worth & Denver City, near Matlock, Tex., two engines pushing a rotary snow plow were derailed in a drift and were ditched. The fireman was killed and the engineman injured.

dence, R. I., a passenger train was derailed at a switch and ran against an engine standing on a sidetrack; 7 trainmen injured.

14th, on Atlantic & Danville, near Aringdale, Va., a freight train was derailed while running at considerable speed, and several cars were ditched. A brakeman was killed.

17th, on Manhattan Elevated, at South Ferry, New York City, the locomotive of a passenger train entering the station was derailed at a facing point switch, or ran upon the wrong track, and after running nearly clear of its own track was struck by the foremost car and pushed some distance away from the tracks, though it was supported by the wide yard-platform and did not fall to the street. The cars ran along to the end of the track and bumped violently against the bumping post. Three passengers were slightly injured.

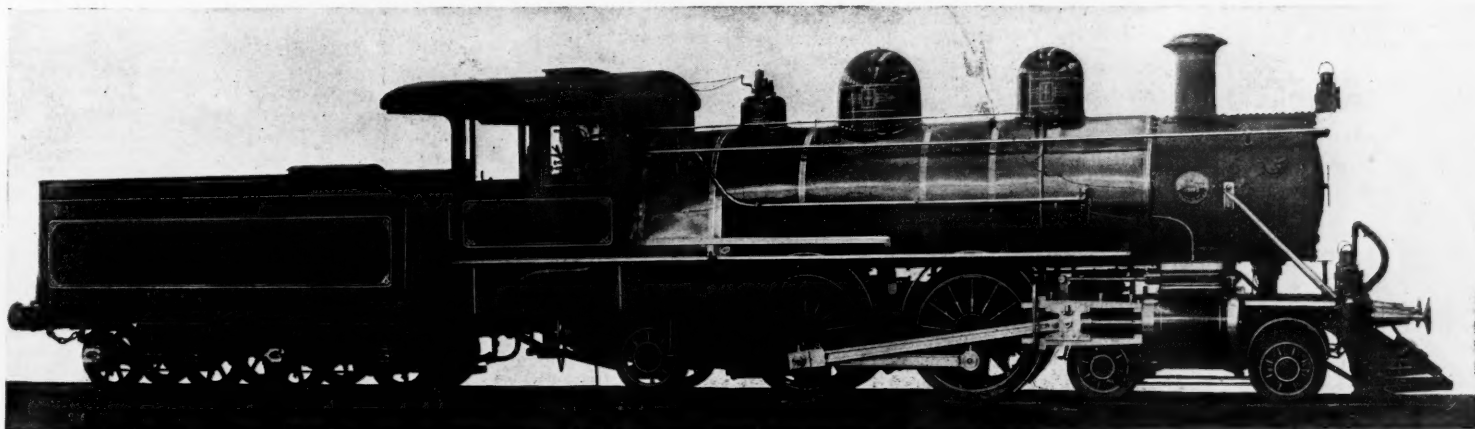
25th, on Charleston & Western Carolina, near Spartanburg, S. C., a freight train broke through a bridge and 12 empty coal cars fell into the Tiger River. Two tramps were killed. There is no evidence of any defect in the bridge, and the officers of the road believe that a car must have been derailed by the failure of a drawbar or of a car body. The bridge, which was of medium steel, was made by the Passaic Rolling Mills, Paterson, N. J., and erected by Grant Wilkins, of Atlanta. It was about two years old. The plans and the material were inspected by G. W. G. Ferris & Co. The bridge was 610 ft. long and 80 ft. high at the highest point. There was one 100-ft. span, five 60 ft. spans and seven 30-ft. spans. The bridge was designed to carry a 90-ton engine, followed by a load of 3,500 lbs. per lineal foot. The final inspection was made by Mr. Bellingrodt, Chief Engineer of the Bridge Department of the Lombard Iron Works, Augusta, Ga.

27th, on Southern Pacific, near Hornbrook, Cal., a freight train was derailed and several cars were wrecked. One man was killed and another injured.

And 12 others on 10 roads, involving one passenger train and 11 freight and other trains.

OTHER ACCIDENTS.

3d, 10 p. m., on Cincinnati, Hamilton & Dayton, near Hamilton, O., an officers' car attached to the rear of a northbound passenger train took fire from the heater and was burned up. The porter, the only occupant of the car, started a fire and went into another room. Soon after he found that the wind was blowing the flames out through the lower door against the woodwork, the smoke jack on the top of the chimney having become fixed with the opening northward. In his excitement the porter neglected to stop the train for some time, and the flames got beyond control.



Narrow-Gauge Passenger Locomotive for the Japan Railway Co.

Built by the BALDWIN LOCOMOTIVE WORKS, Philadelphia, Pa.

and caught fire from overturned stove and destroyed. The two forward cars of train No. 524 were off the track and slightly damaged. Four trainmen were injured, of whom one died the next day.

19th, on Philadelphia & Erie, at Pottsville, Pa., a passenger train of the Lehigh Valley ran into a freight car which had been accidentally pushed upon the main track from a siding, and the engine was ditched. The engineman was killed and 3 trainmen and 7 passengers were injured.

20th, on Central of Georgia, at Savannah, Ga., a passenger train of the Florida, Central & Peninsular, moving backward, collided with a freight train, and a car containing 15 passengers fell down a bank, breaking loose from its trucks and rolling over. The passengers escaped with slight injuries.

25th, on Fitchburg road, at Greenfield, Mass., collision between a freight train and a switching engine; one engineman badly injured.

28th, 7 p. m., on Brooklyn Elevated road, near Van Siclen avenue, Brooklyn, N. Y., an empty engine ran over a misplaced switch and into the side of a passenger train. The engine and one car fell to the street below, and the engineman of the passenger engine, the fireman of the empty engine and 5 passengers were injured, the engineman fatally. The switch was properly lighted; it was on the fireman's side of the engine.

29th, 3 a. m., on New York & Long Branch, at Sea Girt, N. J., a passenger train ran into a freight train which was switching on the main track, badly damaging the engines of both trains. Two trainmen were injured. It is said that the flagman of the freight placed his red lantern on a snow bank and that it was covered or obscured by the drifting snow.

29th, on New York & Brooklyn Bridge Railroad, at the New York end, an empty passenger train ran into another empty passenger train at the crossing of two tracks, overturning one car.

And 7 others on 7 roads, involving 3 passenger and 9 freight and other trains.

DERAILMENTS.

DEFECTS OF ROAD.

1st, on Keokuk & Western, near Norwalk, Ia., a passenger train was derailed at a point where the track had been made unstable by heavy rains. Three passenger cars fell into the ditch and the baggage-car was overturned. Two passengers and one trainman were injured.

13th, on Toledo, Peoria & Western, at Seito, Ill., a passenger train was derailed by a broken rail and the engine and 4 cars were ditched. The engineman was killed and the baggageman and 5 passengers injured.

4th, on Denver & Rio Grande, near Elk Park, Col., a passenger train was derailed by a rock which had fallen upon the track, and the engine fell into a river. The engineman was killed.

5th, on Northern Pacific, at Tacoma, Wash., a switching engine was derailed and ditched by running into a landslide, and the engineman was injured.

6th, on Savannah, Florida & Western, near Ybor City, Fla., a passenger train was derailed by a malicious obstruction, the engine being overturned, engineman and fireman injured.

7th, on Great Northern, at Donaldson, Minn., a passenger train was derailed in a snowdrift and the foremost of the two engines drawing it was overturned. The engineman was fatally injured.

16th, on Pennsylvania road, near Media, Pa., a passenger train was derailed by a shovel handle, which had been wedged in the flangeway, and the engine fell down a bank. The engineman and fireman were injured. The obstruction was placed upon the track by two boys, one 13 and the other 9 years old.

16th, on Texas & Pacific, near Springdale, Tex., passenger train No. 3 was derailed by a malicious obstruction and the engine was overturned. The first two cars were badly damaged. The engineman was killed and the fireman and express messenger were injured.

23d, on Cincinnati, New Orleans & Texas Pacific, near Nemo, Tenn., passenger train No. 3 was derailed by a rock which had fallen upon the track, and the engine fell down a bank. The first two cars were damaged. The engineman and fireman were injured.

And 5 others on 5 roads, involving 2 passenger and 3 freight trains.

UNEXPLAINED.

4th, on Pennsylvania road, at 41st street, Philadelphia, a car in a freight train on a side track was derailed and ran against a passenger train standing at the station, badly damaging one passenger car and injuring 9 passengers, 8 of them not very seriously.

5th, on Chicago, Burlington & Quincy, near Carson, Ia., a passenger train was derailed near a trestle bridge, and a passenger car, after running upon the bridge, fell to the ravine below. Fire started from the stove and the car and the trestle were burned up. Three passengers and two trainmen were injured, one of the passengers probably fatally. The uninjured trainmen rescued all the passengers from the car in season to prevent their being burned.

6th, on Baltimore & Ohio, near Wheeling, W. Va., a car in a freight train was derailed and fell upon the adjoining main track, where it was struck by another train. Two employees were injured.

9th, on New York, New Haven & Hartford, at Provi-

9th, on Lehigh Valley, near Dallas, Pa., a passenger car attached to a freight train which was ascending a grade broke loose and ran back to Luzerne, where it ran into an electric street car which was crossing the track. Most of the passengers in the latter succeeded in getting out, but one was fatally injured. It is said that two brakemen on the runaway passenger car made ineffectual attempts to apply the brake.

20th, on New York, New Haven & Hartford, at Wallingford, Conn., a pay car was damaged by the explosion of its heater. One employee was slightly injured. A building near by was damaged by the flying fragments of the stove.

26th, on Kansas City, St. Joseph & Council Bluffs, at Forest City, Mo., the engine of a heavy passenger train broke away from its tender just as it was starting away from the station. The sudden disconnection of the load caused the engine to plunge forward so rapidly that the engineman fell out of the cab to the ground, and although the tender ran only about its own length after the breakage, the engineman was badly injured by the running gear.

28th, 2 a. m., on Missouri, Kansas & Texas, near Hillsboro, Tex., the engine of a freight train was badly damaged by an explosion of the inside shell of the fire box. The fireman was killed.

And 2 others, involving 2 passenger trains.

A summary will be found in another column.

Baldwin Locomotives for Japan.

We have recently recorded a number of orders placed with the Baldwin Locomotive Works for engines to go to Japan. In all, we find records of 57 engines recently ordered, of which 26 are passenger engines.

We are permitted to publish now an engraving from a photograph of a passenger locomotive built for the Japan Railway Co. There are 23 passenger engines included in this lot. The general arrangements and appearance of the engines are very well shown in the engraving. It will be seen that it is an adaptation of the Atlantic type with the firebox extended over the R frame. The details are given in the following pretty complete table of specifications:

DESCRIPTION OF BALDWIN LOCOMOTIVE FOR THE JAPAN RY. CO.
Gage 3 ft. 6 in.
Kind of fuel to be used Bituminous coal,

Weight on drivers.....	52,000 lbs.
" front truck.....	25,400 "
" trailers.....	25,400 "
" total.....	100,000 "

General Dimensions.

Wheel base, total, of engine.....	22 ft. 6 in.
" driving.....	6 ft.
" rigid.....	12 ft.
Heating surface, firebox.....	98.15 sq. ft.
" tubes.....	1,461.70
" total.....	1,559.85
Grate area.....	30 "

Wheels and Journals.

Drivers, diameter.....	centers, 50 in.; outside, 56 in.
Driving Tires—Cast steel, 3 in. thick; both pairs flanged 5 in. wide. Tires held by shrinkage, shoulder and set screws.	
Truck wheels, Vaucrain steel-tired, diameter.....	28 in.
Trailing wheels, diameter.....	33 in.
Journals, driving axle (steel), size.....	Diameter, 7½ in.; length, 8 in.
" trailing axle, size.....	Diameter, 6½ in.; length, 9 in.
Truck axle, size.....	Diameter, 5½ in.; length, 8 in.
Trailing, truck and tender wheels with wrought iron centers. Tires held by shrinkage and retaining rings.	

Cylinders.

Cylinders, diameter.....	18 in.
Piston, stroke.....	22 in.
Kind of piston rod packing.....	U. S. metallic
Valves, kind of.....	U. S. slide

Boiler.

Boiler, type of.....	Straight, with one dome placed centrally; separate dome for safety valves and whistles
" working steam pressure.....	180 lbs.; tested to 220 lbs. by hot water pressure.
" material in barrel.....	Homogeneous cast steel
" thickness of material in barrel.....	7½ in.
" diameter of barrel.....	58 in.
Seams, kind of horizontal.....	Double riveted
Thickness of tube sheets.....	¾ in. and ¾ in.
Mud ring.....	Double riveted
" crown sheet.....	¾ in.
Crown sheet stayed with.....	Copper stay bolts

Tubes.

Tubes, number.....	189
" material.....	Brass
" outside diameter.....	2 in.
" length over sheets.....	14 ft. 11 in.

Firebox.

Firebox, length.....	6 ft.
" width.....	5 ft.
" material.....	Copper
" thickness of sheets; side and back.....	¾ in.

Grate, kind of.....	Cast-iron, rocking
Smokebox, type.....	Extended, with netting, etc.
Stack, straight or taper.....	Straight

Tender.

Capacity of tank.....	3,000 gals.
Frame.....	Channel iron
Trucks.....	Square wrought iron
Wheels, kind of.....	Vaucrain steel tired
" diameter.....	33 in.
Journals.....	Diameter, 4¼ in. length, 8 in.

Other Parts.

Guides—Of steel; brass bearings.	
Crossheads of steel.	
Connecting and Side-Rods—Forged solid. Fluted main rods.	
Feed-Water—Supplied by two No. 8½ Sellers' 1887 injectors.	
Cab—Iron, with double roof, with air-space between, and ventilator.	
Furniture—Engine furnished with with sand-box, two whistles, heater, blower, and two 3-in. Coale encased safety-valves, steam gauge, cab-lamps, two glass water gauges, oil-cans, tallow-pot, two jack-screws and levers, one pinch-bar, a complete set of wrenches to fit all bolts and nuts on engine, one monkey-wrench, hammer, chisels, cab-seat, poker, scraper, slice-bar, Nathan lubricator, American non-automatic vacuum brake on driving and tender wheels.	
Finish—Hand-rails of iron; running-boards of iron; wheel-cover nosings of iron; boiler lagged with sectional magnesia and jacketed with planished iron secured by brass bands. Spring buffers front of engine and back of tender.	

Ohio Express Company Tax Law Sustained.

The decision of the Supreme Court of the United States sustaining the "Nichols law," the Ohio statute which authorizes the taxing of telegraph, telephone and express companies as railroads are taxed, has aroused a good deal of discussion in financial circles interested in the express business. It is based, substantially, on the theory that the express business depends for its profit and prosperity upon a connected and continuous franchise; although it may own no tangible property between, say, Pittsburgh and Cincinnati, the wagons, horses and office furniture in the former city have the same sort of connection with and relation to the wagons, horses and furniture in the latter as do similar appliances of a railroad company; and the state, therefore, is justified in taxing these articles, not as individual pieces of property, but as parts of a business instrumentality or organization extending from one state into another. The decision, prepared by Chief Justice Fuller, secured only a bare majority of the Court in its favor.

The Nichols law was passed in 1893 and amended in 1894. Under it the Auditor, the Treasurer and the Attorney-General of the State assess the tangible property of the companies. Every year they must, among other things, ascertain the market value of the stock of express companies and be guided thereby in assessing the companies' property. Mileage of line operated is to be considered the same as in the case of railroad companies. Acting under this law, the board has assessed the tangible property of the Adams, the American and the United States at about 16 times what its value would be, taken by itself, the surplus being supposedly the value of the franchise.

Chief Justice Fuller says that as regards the validity of the law under the constitution of Ohio the Supreme Court will take no action, the State Court of last resort having decided in favor of the law. This State Court decision was on a controversy prepared for the purpose of obtaining adjudication, but the objection that this was not a genuine controversy is also held to have been settled by the State Court. The chief argument of the defense was that the tax, while purporting to be on property was, in fact, levied on the business, which is interstate commerce, and cannot be directly subject to state taxation. But property belonging to companies engaged in interstate commerce may be taxed by the state, and the decision holds that this Ohio tax is essentially a property tax.

The physical unity existing in the case of railroad companies, is lacking in express companies, but there is "the same unity in the use of the entire property for a specific purpose, and there are the same elements of value arising from such use." The case of the Pullman Car Company vs. Pennsylvania, 141 U. S. 18, is quoted in support of this view. The state of Pennsylvania was allowed to tax a portion of the value of Pullman cars which ran partly in other states.

In justification of the theory supported, the decision says: "A horse is indeed a horse, a wagon a wagon, a safe a safe, but how is it that \$23,430 worth of horses, wagons and safes produced \$275,446 in a single year? The answer is obvious. . . . Assuming the proportion of capital employed in each of several states through which such a company conducts its operations has been fairly ascertained, while taxation thereon, or determined with reference thereto, may be said in some sense to fall on the business of the company, it is only indirectly. The taxation is essentially a property tax, and, as such, not an interference with interstate commerce."

There is no showing that any part of the express companies' property in Ohio ought to be deducted before making a valuation by mileage, so the assumption is that all of the property may be fairly distributed upon the mileage basis. "The states through which the companies operate ought not to be compelled to content themselves with a valuation of separate pieces of property disconnected from the plant as an entirety, to the proportionate part of which they extend protection, and to the dividends of whose owners their citizens contribute."

As to whether the valuations are excessive the decision says:

"The method of appraisement prescribed by the law was pursued and there were no specific charges of fraud. The general rule is well settled that 'whenever a question of fact is thus submitted to the determination of a special tribunal, its decision creates something more than a mere presumption of fact, and if such determination comes into inquiry before the courts it cannot be overthrown by evidence going only to show that the fact was otherwise than as so found and determined.'"

Justice White, who is sustained by Justices Field, Harlan and Brown, filed a dissenting opinion which is considerably longer than the decision of the court. He begins by quoting a lot of decisions in suits regarding the taxation of vessels in foreign or interstate trade. In the case of Gloucester Ferry Company vs. Pennsylvania, 114 U. S. 196, where a New Jersey company ran a ferry to Philadelphia, Pa., the state of Pennsylvania was not allowed to tax the capital stock of the New Jersey company. The Supreme Court of the United States held that the tax could only be considered as a tax for the franchise of carrying on the business, and the business was interstate.

Justice White emphasizes the great difference between the value of the express companies' property, considered by itself, and the valuations fixed by the Ohio State Board. It is held that it is beyond all reason to make assessments so very much higher than the intrinsic value of the property. In some cases the excess was more than 20-fold, and "there is no reasonable doubt that the sources of some of the reported value were entirely outside the jurisdiction of the state of Ohio." "The language of the Ohio law and of the decision of the Ohio Supreme Court in the matter is held susceptible only of one meaning, that is, that in assessing the actual intrinsic value of tangible property of express companies in the state of Ohio it was the duty of the Assessing Board to add to such value a proportionate estimate of the capital stock, so as thereby to assess not only the tangible property within the state, but also along with such property a part of the entire capital stock of the corporation, without reference to its domicile, and equally without reference to the situation of the property and assets owned by the company from which alone its capital stock derives value. In other words, although actual property situated in states other than Ohio may not be assessed in that state, yet that it may take all the value of the property in other states and add such portion thereof, as it sees fit, to the assessment in Ohio, and that this process of taxation of property in other states, in violation of the constitution, becomes legal, provided only it is called taxation of property within the state. I submit that great principles of government rest upon solid foundations of truth and justice, and are not to be set at naught and evaded by the mere confusion of words."

The bonds, stocks and other investments of the express companies representing their capital are situated in New York, Pennsylvania and Massachusetts, and are, of course, entirely and wholly at their full value assessable in those states. Ohio taxing a part does not deprive the other states of their right to assess the property at its full value; this subjects property to double taxation, and if the other states named were independent of the constitution of the United States they would be driven to protect themselves by retaliatory legislation.

Ohio, besides taxing under the Nichols law, assesses the real estate of express companies, and also imposes a tax on their gross receipts for business done within the state. The Supreme Court of the state, in sustaining the tax on gross receipts, says that there is no double taxation because the Nichols-law tax applies only to tangible property. This Ohio decision, therefore, sustains these enormous valuations as assessments upon tangible property, while Justice Fuller's present decision is able to sustain them only by treating them as based on something other than tangible personal property. "The wound which the ruling announced, if I correctly apprehend it, inflicts on the Constitution, is equally as severe upon the unquestioned rights of the states as it is upon the lawful authority of the United States, because

while submitting the states and their citizens to injustice and wrong committed by another state, it at the same time greatly weakens or destroys the efficacy of the interstate commerce clause of the constitution."

Justice White says that many of the decisions of the Supreme Court relied upon to sustain the present opinion of the court were nullified by a subsequent decision (Pacific Express Co. vs. Seibert, 142 U. S., 339).

There was a case before the Supreme Court of Mississippi, which is relied upon to support the present decision but in that case the tax put upon a telegraph company was levied in lieu of all other taxes. The sum of the previous decisions cited is that the validity of a state tax ought to be determined by the substantial results of the burden imposed and not by the mere form which it assumed. In the recent decision of W. U. Tel., etc., 163 U. S., 1, it is clearly intimated that a taxation law could not be upheld which in its necessary operation was shown to be oppressive and unconstitutional.

Justice White dismisses the sleeping-car case, because the tax in fact was only \$15 per car per year. If the unit rule, justifying estimates by mileage, is applicable to telegraph lines "that is pushing the power of state taxation at least to the confines of the constitution." The mere ownership by an express company of personal property within a state presents no case for the application of the rule. "It is declaring that a mere metaphysical or intellectual relation between property situated in one state and property found in another creates as between such property a close relation for the purposes of taxation. But this theory by an enormous stride at once advances the unit rule beyond every constitutional barrier, and causes such rule or theory to embrace property between which there is not, and cannot in the nature of things be, any real union of relation whatever."

This court has effectually determined that where a corporation is engaged in interstate business no one of the states has the power to tax the receipts of such company from interstate business. "There is no force in the argument advanced at bar that we have entered a new era requiring new and progressive adjudications, and that unless this court admits the power of the state of Ohio to tax to be as claimed, it will enable aggregations of capital to escape just taxation by the several states. This assertion, at best, but suggests that unless constitutional safeguards be overthrown, harm will come and wrong will be done. In its last analysis the claim is but a protestation that our institutions are a failure, that time has proven that the constitution should not have been adopted, and that this court should now recognize that fact and shape its adjudications accordingly. The claim is as unsound as the fictitious assertion of expediency by which it is sought to be supported. If it be true that by the present enforcement of the constitution and laws property will escape taxation, the remedy must come not from violating the Constitution, but from upholding it."

Malingering.

Dr. George R. Weist, Surgeon of the Pennsylvania lines, at Richmond, Ind., in a paper on this subject, recently read before a literary society in that city, states that he learns, on good authority, that the railroads of England, in a period of five years, paid out \$11,000,000 to persons claiming to have been suffering from spinal injuries received while travelling on the cars; and that a large part of the claims represented in this immense sum were based on pure malingering—lying to get money. Dr. Weist estimates that in the same time probably more than the sum named is paid out by the railroads of the United States for fictitious injuries. The doctor made an exhaustive study of his subject, giving numerous instances, from the history of the last 300 years, of prominent people, including kings and military officers, who have lied to escape duty or danger. In our last war cowardice in the army "was by no means confined to privates." Accident insurance companies have found the injuries to the left hand so much more numerous than those to the right that they now pay only about one-half as much money for an injury to the left as to the right. The speaker evidently understands this difference to have been made wholly because of the discovery of frauds; that is, of cases where a person voluntarily injured his left hand or arm to get money. From a large number of examples cited by Dr. Weist we quote the following:

In a suit against the Pennsylvania Railroad an injury to the back followed by disease of the kidneys was alleged. Although there was evidence that no injury had been received, all the usual subjective symptoms of such injury and disease were claimed to be present. The proper objective symptoms were also found by a doctor having a strong desire to appear in court as an expert witness. Owing to the combined shrewdness of client and attorney, so well convinced was the doctor of the real presence of disease that on the witness stand he gave it as his opinion the claimant could live but a short time. The case being compromised, a large sum of money being paid, the restoration to health of the patient was rapid. In this case the medical expert was entirely honest. He was the victim of a shrewd attorney who tickled his vanity and suspended the operation of his judgment, while the claimant played his part with great skill. It was hardly fair, however, after the case was settled, for the attorney employing him to shock the doctor's self-esteem by offering to wager with him a considerable sum of money that his client had no disease whatever.

A woman in another county claiming to have been injured in a collision brought suit against the same company. It was claimed that concussion of the brain and spine had been received resulting in constant pain in the head, partial loss of vision and paralysis of the arms and lower limbs to a degree preventing the raising of the arms to the head or walking. For nearly two years

while the case was in litigation she lay almost constantly in bed, submitting to a great variety of treatment without improvement. The most careful examination failed to discover any physical sign of disease or injury. She was carried on a stretcher into the court-house and testified to all these disabilities. After receiving some compensation in money she recovered rapidly, and has since continued well.

Lately in Philadelphia a woman sued the same company for \$20,000 for alleged injury received from a sudden jar caused by the coupling of a car to the rear of the train. No other passenger was injured, and the examination of a competent surgeon soon after the accident disclosed no physical sign of injury. Very many serious symptoms soon developed, among them lateral curvature of the spine, with great lameness and entire inability to walk except with crutches. Just before the trial a settlement for \$2,500 was effected and the plaintiff who came walking into the room on crutches and very lame, to receive a check and sign a release, immediately after this, got up, walked out without the crutches and without any lameness; shortly after she married and continues in good health.

Hundreds of similar cases might be presented, as this one railroad company pays every month thousands of dollars to satisfy claims well known to be fictitious and to be based on malingerings alone. To ask why claims of this kind are paid which are known to be dishonest without contesting them in the courts is pertinent. It is cheaper—as already stated—to compromise than to enter into litigation. The widespread socialistic theory that the rich have no rights which the poor are bound to respect causes juries to decide almost invariably against corporations, regardless of law or evidence. It may be seriously questioned then, if, in these cases, the present

The employees of the road of which Mr. Thomas is President have contributed to the success of the Exposition by raising nearly \$20,000. This amount was in addition to the sum of \$25,000 subscribed by the Nashville, Chattanooga & St. Louis Railroad Co. and to an equal amount given by the Louisville & Nashville. The roads have also shown their interest by granting free transportation of

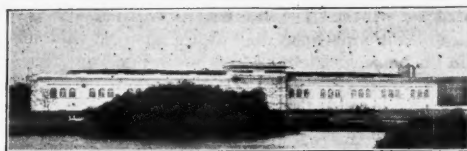


Fig. 2.—Transportation Building.

lumber and other building material and have arranged to carry exhibits to and from the Exposition at half rates. The passenger fares to and from Nashville will be reduced and the roads will endeavor to secure the co-operation of all connecting lines, so that those attending the Exposition will secure very low rates. The railroad facilities at the park are all that could be desired. The tracks of the Nashville, Chattanooga & St. Louis Railroad run



Fig. 1.—Transportation and Agricultural Buildings—Tennessee Centennial Exposition.

jury system does not more often lead to a miscarriage of justice than otherwise. The method of selecting the jury is largely responsible. The exclusion from these bodies of persons who may have formed an opinion about the case; the right of peremptory challenge and to set men aside for cause is often abused with the effect of restricting the choice of jurors to the most ignorant, instead of to the most intelligent. Men who do not read, study or think are exactly the sort of men to be led astray by their prejudice or by glib-tongued lawyers and made to forget the evidence. What is wanted of the jurymen is not original ignorance of the case, but that cast of mind to give a verdict on the evidence presented on the trial.

The unanimous conclusion of the jury seems a great absurdity. Two witnesses to the same transaction can rarely agree as to details, yet a jury of 12 men, often ignorant and totally untrained in the examination of legal questions or evidence, are expected to agree, in the face of a mass of contradictory evidence, and after listening for hours or days to arguments of counsel skilled in making the worse appear the better reasoning, and without a scrap of written or printed testimony before them. If they do not agree at first they are kept in confinement until the strongest will can conquer the rest, or until their natural desire for a discharge impels them to agree, whether the verdict represents their real convictions or not, or the case in all its dreary length must be gone over again or abandoned. If these defects appear in the trial of ordinary cases, how much more clearly must they be seen in malpractice and railroad cases, in which are often involved questions demanding the highest technical knowledge for their solution. A common method,

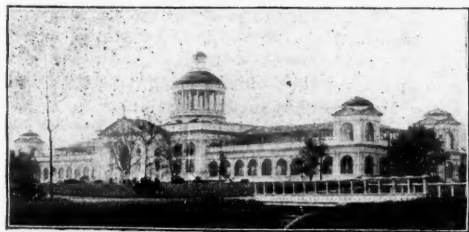


Fig. 3.—Commerce Building.

it is said, of arriving at the proper amount of damages is for each jurymen to name his idea of the proper sum to be awarded, and these sums to be added together and divided by 12 to get the result. In some cases the last step of dividing by 12) would seem to be omitted. . . .

Some Special Features of the Tennessee Centennial Exposition.

We have previously referred in a general way to the Exposition which will be opened at Nashville, Tenn., the first of next May and close the last day of October. Nearly all of the principal buildings have been completed, while the smaller and less important ones are now under construction. The accompanying engravings which were reproduced from photographs taken about two months ago, will give the reader an idea of the appearance of three of the larger buildings. There will be in all, 12 main exhibit halls and some of these promise to be even more attractive than those which we illustrate.

Maj. John W. Thomas, President of the Nashville, Chattanooga & St. Louis Railroad, is President of the Exposition Company, and to his efforts is largely due the interest which the railroad men of Tennessee have taken in celebrating the 100th anniversary of that state.

into and around the grounds, so that material and exhibits can be taken to the doors of the Commerce, Machinery, Minerals and Forestry and Agricultural buildings, and into the Transportation Building.

Machinery Hall, which is 526 ft. long by 124 ft. wide, is one of the largest buildings of the group, and judging from the present indications, the railroads will occupy a large portion of this as well as of the Transportation Building. Both of these buildings are similar in general appearance. The power station, containing the boilers and engines which will furnish the power for all machinery, will be located some distance away so that Machinery Hall will not be unpleasantly warm during the summer days.

West of the Parthenon, or the Fine Arts Building, and between the Commerce and Agriculture buildings, with a heavily shaded avenue on the one side and Lake Watauga on the other, is the Transportation Building, shown in both Figs. 1 and 2. The sculpture and relief work illustrate the development of the art of carrying, from the old creaking cart to the most completely equipped express train. The structure is 400 ft. long and 120 ft. wide. Railroad tracks run through the building, on which will be exhibited some of the finest engines, day coaches and sleeping-cars. The balance of the floor space has been divided into sections of convenient size for the installation of other exhibits under the above classification, which includes wagons, carriages and bicycles.

The terminal station, which is in the Renaissance style of architecture, is situated between the Agriculture and Transportation buildings on the northern boundary of the Exposition Park, as may be seen in Fig. 1. The location is in every way desirable. It will be used both as a terminal station for the steam railroads and for the exhibits to be made by several of the large Southern railroads. It is 100 ft. square, and the lower floor will be occupied by the Plant system of railroads and the Georgia and the Southern railroads. The upper floor will be occupied by the Nashville, Chattanooga & St. Louis, and the Louisville & Nashville Railroad may also participate. The exhibit of the Plant system will be in the center of the first or ground floor, while the Georgia Railroad Co. and the Southern Railway Co. will occupy respectively the eastern and western sections of the same floor. These companies will present their roads in miniature and will furnish valuable and interesting data relative to the country through which they pass. The exhibit in this building will thoroughly illustrate the evolution of the railroad and telegraph from their introduction up to the present time.

Train accommodations will be ample, so that the crowds can be handled without difficulty. The fare will be five cents each way to and from Nashville and in addition to the steam railroads, four electric roads will run into Exposition Park.

The Commerce Building, shown in Fig. 3, is the largest of the group, and is designed for the exhibition of manufactures and liberal arts. It is 500 ft. long by 315 ft. wide, and built in the form of a T, the wings being 150 ft. in width. The central pavilion runs back 315 ft. and in this section the foreign exhibits will be placed.

The present site of the park was formerly known as the Old West Side Park, to which adjacent property has been added, making a tract of 200 acres in all, and is situated a little more than two miles from the Public Square of Nashville and directly north of Vanderbilt

University. It commands a beautiful view of the city of Nashville and of the picturesque scenery in the vicinity of Exposition Park.

The Authority of the Interstate Commerce Commissioners.

From the brief of Hon. Edward B. Whitney in the case of *The Interstate Commerce Commission v. The Detroit, Grand Haven & Milwaukee Railway Co.*, recently argued before the United States Supreme Court, we extract the following able exposition of the extent and grounds of the Commission's authority as it is regarded in the United States Attorney General's office:

A decision by a court of first instance, at chancery or at *nisi prius*, is ordinarily made by a single judge, and by a judge presumably of less learning and experience, if not of less ability, than those who are to review him. The record upon appeal comes before a tribunal of from three to nine judges and receives the benefit of their combined wisdom. In a chancery suit or other case in which the trial judge does not see the witnesses, he has only one advantage over the appellate tribunal, namely, that he is usually able to hear counsel more at length and give more minute consideration to the questions involved. Nevertheless, his opinion is presumed to be correct, and the burden is cast upon the appellant, whether he were plaintiff or defendant originally.

When the Interstate Commerce Commission, however, applies to the Circuit Court for an injunction in order to enforce one of its orders, and the circuit judge undertakes to review the questions of fact and law involved in the controversy, the appeal is not from one man to three or nine, but usually from five men to one, and even in this, an extreme case, an appeal from three to two. The circuit judge is presumably, perhaps, more learned in the law—even in interstate-commerce law—than the Commissioners whom he is reviewing. Even Judge Cooley, when he ceased to be a judge and became a Commissioner, is perhaps to be presumed to have lost some of his judicial learning. But upon the questions of fact, however, the commission are presumably far more expert than the judge. The railroad system of the country, with which they have to deal, is one of great complication and of very delicately balanced interests. To understand it properly, even the wisest man must give up a large part of his time to its study.

Congress has with wisdom provided that the controversy arising under this law shall be primarily decided by a body of experts, whose entire time is to be devoted to the study of this one specialty and the consideration of the peculiar problems which it involves. The appointing power, in carrying out the wishes of Congress, has constituted this body of experts with great care, selecting some from among the distinguished members of the bench or bar, others from the railroad commissions established by the various states. They are not forced, as is this court or the circuit court of appeals, to hear a case of vast public importance under the cramping limitations which hamper the argument of a complicated case on a crowded docket. They are not even embarrassed by the mass and variety of business which confronts a district judge. They can hear and discuss such a controversy as fully as its complication and intrinsic importance demand. The deliberation with which they proceed is illustrated by the fact that their published volumes of reported decisions average less than 1 to every 18 months.

Upon every complicated question brought before it, the commission is presumed to, and does, furnish a supply of special knowledge of the facts bearing upon the controversy and of the interests which are to be affected by its decision, which a judge who is engaged in adjudicating the vast variety of controversies that come before a Federal tribunal can never hope to do.

Under these circumstances we believe the following propositions to be not merely sustainable, but scarcely necessary to argue:

First, that very unusual weight should be placed by the courts upon the commission's findings of fact; and that such findings should be supervised only to the extent of correcting such clear abuses as would warrant setting aside the verdict of a jury.

Second, that especial weight should be placed upon the commission's findings as to the existence of alleged usages, and upon other questions of fact whose intelligent settlement requires the knowledge of a specialist.

Third, that in main the work of the courts should be confined to a review of the commission's decisions upon questions of law, as to which the skill of the commission is presumably less instead of greater than that of a court.

Otherwise we can never secure an efficient administration of this most important statute; for by the time that the case reaches this court, if the question be one of reasonableness of rates, the conditions may all have changed.

The Roof-Shield in the Boston Subway.

The cost of the roof-shield, complete with appurtenances, will be about \$6,000, instead of \$9,000, as stated in our last issue. The diameter of the jack-plungers was incorrectly given in our article of Feb. 12 as 10½ in., the true diameter being 6 in. This would make an average total pressure now being used of 140 instead of 430 tons, but the latter figure represents the maximum calculated pressure, corresponding to 3,000 lbs. per square inch.



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EDITORIAL ANNOUNCEMENTS.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies in their management, particulars as to the business of the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and railroads, and suggestions as to its improvement. Discussions of subjects pertaining to all departments of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMNS. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers, can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

There seems to be more than an even chance that a trial of electric traction will be made on one of the lines of the Manhattan Elevated railroad in New York. Mr. Fransioli, the General Manager, has recently made a pretty careful personal examination of the electric working in Chicago, and has reported to his directors very favorably upon the mechanical conditions as he found them there. He is satisfied that with electric motors trains can be handled at the termini with greater speed and precision, and he is pretty well convinced that there is considerable economy, not only in the fuel account, but in cost of maintenance of track and structure and in other particulars; and of course the electric method has decided advantages, so far as the public is concerned, in cleanliness and quietness. He is disposed to believe that the public can be better served by running trains at more frequent intervals, even if shorter trains are used, which, of course, is not a necessity of electric traction. The result of all this is that there is considerable probability now that one of the lines of the system will be fitted before a great while for electric traction. This, however, is not yet certain and no contracts have been let.

A brief paper by Mr. R. W. Hunt, which will be found on another page, seems to us to have especial interest. Those who keep well posted on rail matters will remember his paper before the Institute at the Atlanta meeting, which was published in our issue of Oct. 18, 1895, page 688, and which those who are interested in such matters should read again in connection with the short report now made by Mr. Hunt. It will be observed that he says that steel still harder than he specified two years ago will be used in this year's deliveries. His chemical specifications as laid down in the Atlanta paper are: Carbon, in 70-pound rails, 0.43 to 0.51; in 75-pound rails, 0.45 to 0.53; in 80-pound rails, 0.48 to 0.56; 90-pound rails, 0.55 to 0.63; 100-pound rails, 0.62 to 0.70; phosphorus not to exceed 0.085; silicon not below 0.10, the remainder of the chemical composition to be left to the maker's judgment. Mr. Hunt says that over 186,000 gross tons of rails over 65 pounds per yard have been made in accordance with the specifications which he presented in the Atlanta paper, and inspected by his firm. He does not know how many tons have been made to the same specifications that have not come under his observation. The users unite in believing that these rails promise much better wearing results than have previously been obtained, and this is one of the reasons why he expects harder rails to be used to fill this year's orders.

We published last summer an advertisement from the Colony of New South Wales calling for bids for furnishing 150,000 tons of rails. We learn that not one bid was received from the United States or England, and that the only bid received was a local one at a price of £7 14s. which will not be accepted, and it is now said that bids will be called for on modified conditions. Anyone who will take the trouble to turn back to our editorial article on the subject

(*Railroad Gazette*, Sept. 4, 1896, page 622) will see at once why it was absurd to suppose that anyone outside the Colony would bid. The rails were to be made in the Colony from ore and with fuel mined there, and onerous conditions were imposed as to the relations of the contractor with the government in the matter of payment, and with the workmen. In fact, no iron ore is developed in the Colony and the contractor would have needed to begin at the very bottom, find and open his mines, get out his ore, build his blast furnaces and make his pig iron (for no pig iron is made in the country) and deliver the first lot of rails within 18 months. We supposed at the outset, and still suppose, that this whole proposition was a piece of "labor" politics; that it was made in order that the government could say to the labor Members of the Colonial Parliament, and to the labor leaders, "Now you see we are doing everything that we can to develop the industries of the Colony. If we buy rails abroad it is because we cannot induce anybody to undertake to make them here." Probably the response to that will be that the government itself should establish its blast furnaces and rolling mills, but we judge that the colonists throughout Australia are becoming more and more timid about experiments in state socialism.

The principal topics brought before the Car Accountants' Association at its annual meeting this week are well set forth in the committee report which we give in this issue; and the report itself, in form and substance, is a good model for use in associations of any kind where old questions have to be discussed without much new light, as in this case, where, in the absence of fresher themes, or because of the lack of authority to take effective action, it seems profitable to thrash over old straw. We do not, by any means, intend to intimate that the car accountants' subjects are out of date. The assertion of this committee that the construction of furniture cars, adding confusion to the already confused freight car world, still continues, is in itself sufficient justification for speaking out at this time. The members of this committee are competent observers and most of them are on large roads. The true nature of the vicious influence, on the traffic interests of the railroads, of a lot of large cars which are valuable chiefly to freight officials who wish to secretly cut under their competitors' tariffs, has been clearly set forth in former meetings of the association and in the railroad journals; but this committee-report confirms the view, if confirmation were needed, that mere discussion has very little effect on the freight agent who believes his road is starving for traffic. Probably it has no effect at all. The agent can make money by giving the shipper what is practically a large discount, and he reasons, doubtless, that it will be soon enough to desist from the practice when his superior compels him to. At the beginning of this year, when the revised official classification came out, there was a report that the minimum weights for various bulky commodities had been reduced, but those who built hopes on this report soon had them blasted, for it was soon found to be based on a mere rumor, or perhaps nothing more substantial than a wish. Why should not this rumor be converted into a fact?

The Car-Service Committee is to be commended for having the courage to recommend a backward step, as it virtually does in the matter of seal records. We do not know whether anybody can make a satisfactory estimate of the value of a single seal record for the whole of a road, or even for the whole of a division; but in case of doubt it is safe to take the course which gives the most tangible evidence of probable immediate economy. It sometimes looks as though some movements—that for uniform freight classification, for instance—were kept up simply because they have been begun; but it is tiresome to have to listen to committee reports which have been made under the influence of that idea, and the members of the Car Accountants' Association should be thankful that they have a level-headed committee. We assume that, in proposing to depend upon conductors' records for information about car seals, the committee includes yardmasters' records under the head of conductors' records; conductors' records alone do not, of course, always cover the whole of a journey. We do not like to speak in favor of any device that will help to keep loss and damage claims on their travels any longer than they are thus kept under present conditions, and we are well aware that a good many of them fall into the despondency of old age because of the worrying journeys they have to make to find a lot of seal records of doubtful value; but it is hardly likely that anything can add much to the sum total of dissatisfaction now felt by consignees, so we will risk it.

The Burlington's Fast Run.

The fast run made from Chicago to Denver over the Chicago, Burlington & Quincy and the Burlington & Missouri River Railroads, noted briefly last week, stands alone among the remarkable performances of this class. It cannot be compared with records made where all the details are arranged in advance and every precaution is taken to prevent delay.

Generally in preparing for a special fast run, a season of the year is chosen when suitable weather is assured, and the track is in the best condition. The locomotives are carefully chosen and put in good order, special arrangements are made that the track shall be clear far in advance of the train, and all officers and employees are notified to be in their proper places. Often watchmen are stationed at grade crossings along the line through the country and main-track switches spiked. Everything which could cause delay is anticipated.

It is therefore scarcely fair to compare records made under such conditions with a run made in the ordinary course of business, where only 25 minutes elapsed between the order for the train and the time it was ready to start, and where no preparation could be made in advance. It should also be borne in mind that the Chicago, Burlington & Quincy train left Chicago in a snowstorm, with an engine which was built 15 years ago and has until very recently been running in freight service, though lately it has been used to haul the suburban trains from Aurora to Chicago, while one of the regular engines was undergoing repairs. This locomotive, which hauled the special train the first 206 miles, arrived at Burlington so much sooner than was expected by the Iowa officials that they had almost as little notice as those at Chicago.

Moreover, the Superintendents, Assistant Superintendents, Trainmasters and a number of the Chief Train Dispatchers along the main line were attending an officers' meeting at Chicago on the morning this train started, so that none of those who would ordinarily assume the responsibility of seeing that the road was clear, and that no delays occurred, were at their posts. It can safely be said that until after the first 300 miles it was not intended to attempt to break former records.

The locomotives used had small drivers, and are not such as would be selected for a special fast run, but there was no time to make a careful selection. With only one car and few grades the performance, from a motive-power standpoint, is not extraordinary, but credit is due to the engineers and firemen in preventing delays through the failure of machinery, and to the train dispatchers in clearing the road in advance of the special train. Seventy per cent. of the Chicago, Burlington & Quincy and Burlington & Missouri River railroads is single track, where trains moving in both directions had to be passed, while even on double track it was often quite difficult to care for slower trains moving in the same direction.

While the officers of the road, in computing the rate of speed while the train was in motion, do not deduct the time lost by stopping at crossings, and are to be commended for their moderation, the record can be more easily remembered if we do deduct the time thus lost; for, on the estimate given, this makes the rate for the entire journey just about a mile a minute.

The excellent record made in this case is plainly not due so much to equipment, track or the special supervision of the officers as to the careful organization and training shown by all departments, which insured the right thing being done in the unexpected emergency. It was rather a triumph of discipline than of machinery.

Correct Gaging in Mounting Car Wheels.

In mounting car wheels there are four distinct elements to consider, viz.: (1) The flange thickness, (2) the distance between backs, (3) the wheel gage (distance between the impinging lines of the two wheels), and (4) a group of four track dimensions. The relations between these four elements may be varied almost indefinitely by different combinations of the several variables, and in most discussions of the matter it has been made so complicated as to repel and fatigue any one who has not a natural love for this kind of intellectual gymnastics and leisure to indulge his taste. Generally those who have studied the question have not taken the time and trouble to make it clear to others, or have not had the knack of logical analysis and clear presentation. By all odds the best study of the subject that we have ever seen is a paper by Mr. George Tatnall, of the Pennsylvania Railroad, presented at the last meeting of the New York Railroad Club. It is a beautiful example

of industry in collecting facts, of skill and sense in analyzing them, and of simple and lucid presentation; and it is a pleasure, not a task, to read his paper. We shall try here to present a few of the main facts brought out, but advise the reader to get the complete paper, read it and file it for future study.

Mr. Tatnall treats this subject as an expert specialist, not as one who has given an odd half hour to it, now and then. In 1893 he contributed to the *Railroad Gazette* (p. 866) a short paper in which was the germ of the principle which he develops in the paper before us. In the interval he has collected a great mass of observed facts, analyzed and generalized them, and now we have the result.

For the purposes of this paper the track gage is taken at 4 feet 8½ inches; the guard rail clearance (distance between the working lines of guard rails) at 4 feet 5 inches; the throats at 1½ inches; the frog distance (gage line of frog to working line of guard rail) at 4 feet 6½ inches. Of these the frog distance is the most important and varies only with the gage and guard rail clearance. A fact to remember is that this dimension is not altered by the shape of the rail head, as the working faces of the guard rail and the stock rail on the other side of the track, are parallel.

With these dimensions and with the wheel flange 1½ inches thick and with wheels 4 feet 5½ inches between the backs, ideal conditions are got. The flanges are central in the throats, and there can be no blow on guard rail or frog point. So far the M. C. B. rules are correct. But if, with the fixed track dimensions assumed, either of these two wheel dimensions is changed we instantly get conditions that permit blows on guard rail, wing rail or frog point. For example, when our flange is worn to 1 inch, all other conditions remaining as above, we get a blow on the guard rail of ½ inch.

Between the fixed track dimensions and the two variables (thickness of flange and distance between backs) there are certain correct relations. To analyze the subject Mr. Tatnall combines each successive distance between backs, progressing by sixteenths, from 4 ft. 5 in. to 4 ft. 5½ in., with every thickness of flange from 1 in. to 1½ in., also by sixteenths. The result is 13 tables which show the effects of all these combinations with a clearness and completeness that we have never seen attempted before.

In general they show that any two flanges too close together produce guard-rail blows, increasing as flange thickness decreases; any two flanges too far apart give frog-point blows, increasing as flange thickness increases; for the same distance between backs the guard-rail blows diminish as the flange thickness increases; for the same thickness of flange the guard-rail blows decrease as the distance between backs increases; as guard-rail blows disappear frog-point blows appear, increasing with the distance between backs and with the thickness of flanges. Or, to state the same facts a little differently, beginning with heavy guard-rail blows, we pass down through the ideal condition of no blows and then up to heavy frog-point blows.

Considering only flanges of equal thickness there is but one correct distance between the backs of wheels, which is always the difference between the frog distance (4 ft. 6½ in.) and the thickness of our flange. For unequal flanges there are no positions of ideal conditions; the nearest approach is for the distance between the backs to be that required for the thicker flange, which leaves only a guard-rail blow equal to the difference of thickness of the flanges.

In 1894 Mr. Tatnall caused 13,000 pairs of wheels to be measured under 3,500 cars, for frog-point impingements and excess of wheel gage. Of these, 7,366 pairs showed impingements in one or both directions from ⅛ in. to ½ in. The allowable wheel gage of 4 ft. 8½ in. was exceeded in 1,799 pairs, and 85 flanges were more than 1½ in. thick (the M. C. B. rule justifies removal if the flange is over 1⅞ in.). Only 13 per cent. of these cars had all four axles free from defects which would cause impingement on the frog point. The wheels were not gaged for defects that would produce guard-rail blows, but from his observations the author concludes that these defects were present in just as great numbers as those measured, and the measurements demonstrate that "the proportion of cars in service that were correctly gaged must have been a very small fraction of 1 per cent." It is no wonder that so many unexplained derailments take place, or that frogs should worry the maintenance-of-way men.

There was for some years a strong contention that wheels should be mounted not to a distance between the backs, but to a fixed wheel gage. To complete his analysis and to answer the advocates of this

method, Mr. Tatnall makes another set of tables, in which he takes a minimum wheel gage of 4 ft. 7½ in., a medium gage of 4 ft. 8 in. and a maximum gage of 4 ft. 8½ in. These he combines with every flange thickness from 1 in. to 1½ in., varying by sixteenths, producing three tables. These show that there is no fixed wheel gage that will produce perfect conditions; that for every flange thickness there is one correct wheel gage and one only, and that this is invariably the frog distance less the thickness of one flange; and that the one correct combination of wheel gage, flange thickness and distance between backs, is exactly the same condition found to be correct in the first series of tables. Thus he comes down to this general proposition:

While the wheel gage must vary, and the distance between backs must vary, the frog distance measurement must be invariable and fixed, and is the determining feature in the correct mounting of wheels.

He deduces the following rule: The distance between backs should be 4 ft. 6½ in. (the frog distance) less the thickness of one flange, when the flanges are of equal thickness. If they are unequal, the distance between backs should be 4 ft. 6½ in. less the thickness of the thicker flange, and flanges of greater difference than ¼ in. should never be put on our axle.

Mr. Tatnall then proceeds to show that the present M. C. B. rules and recommendations leave possible guard-rail blows of ¼ in. and frog-point impingements of ⅛ in.; that the thicker flanges have been abolished, but the thinner ones can never be mounted correctly; and that the decrease in guard-rail blows by the rule not to remount wheels less than 1½-inch thick in the flange is only partial. With the permitted variation of from 4 ft. 5½ in. to 4 ft. 5½ in. between backs, frog-point blows can only be avoided by limiting the maximum flange to 1½ in. and guard-rail blows by limiting the minimum flange to 1½ in. We shall attempt no epitome of the author's discussion of this point, which is ingenious and thorough and contains some interesting statistics of the number of wheels drawn for thin flanges.

The conclusion of the whole matter is that wheels should be mounted to 4 ft. 6½ in. less the flange thickness. To facilitate this Mr. Tatnall proposes a simple gage which subtracts the flange thickness mechanically.

In what we have written we have not attempted to add any original discussion of this complicated question nor have we done justice to the completeness and the lucidity of the author's discussion. We have tried to present his main argument so briefly that those who have shied at another long paper on mounting wheels might be tempted to read this outline. Having done that they may wish to go further and read carefully the whole paper. It is worth it, and it will not bore or confuse them.

The Agitation of the Railroad Men in Great Britain.

As was to be expected, the victory over the London & North Western has left the employees of all the English roads in an excitable state. It is said that now few days pass without some new meeting between officers and men, usually followed by concessions which the men, of course, denounce as utterly inadequate. But among other things the Great Northern has conceded an extra sixpence a day for engine runners, the Midland, the North Eastern and the North British have introduced at certain busy points an 8-hour day for yard switchmen, while in various towns, in order to shorten the hours of their truckmen, the different competing companies have entered into agreements that none of them will collect goods from their customers after 6 p. m.

A new point has lately arisen. Most of the great companies have established under Parliamentary sanction, pension and provident and superannuation funds for their servants. Three of them are now applying to Parliament for powers in this matter, and Mr. Harford, the Secretary of the Amalgamated Society of Railway Servants, has publicly stated that he proposes to do his best to defeat their applications on the ground that such funds may be and are in fact used to keep the men in subjection to their officers. Mr. Harford's phrase is that the men are "chloroformed into submission." And undoubtedly a man will hesitate to strike, if by so doing he forfeits his claims to a pension toward which perhaps he may have been subscribing for 20 or 25 years. On this side of the water we are familiar with this same difficulty—the reluctance of the men to be provident lest they be kept from striking, by their own thrift. Indeed, this is one of the most unfortunate aspects of trade unionism.

Another new question has arisen with reference to an act, known as the Truck Act, which was passed at the last session of Parliament and came into operation on the 1st of January. This act is one of a

series that in its origin had no connection whatever with conditions of railroad service, but was intended to secure that workmen shall receive in full their nominal wages, and that these wages shall be in money, not in possibly inadequate equivalents for it. It provides that no fines shall be inflicted except in pursuance of a contract which is either in writing signed by the workman or publicly and conspicuously posted in some place open to him. Other provisions require the offenses, which must be such as cause damage to the employer or his business, to be specified, and also the amount of the fine for each offense. Further, the fine must be fair and reasonable and each time a fine is imposed particulars in writing stating the offense and the sum exacted as penalty must be furnished to the defaulting workman.

In order to comply with this act, some companies have recently required their men to sign contracts, while others have posted up notices of the fines they have been in the habit of imposing and of their intention to reserve the right to impose them in future. The list is long, falling into three classes, with fines not exceeding 5s., 10s. and £1 respectively. Class 1 includes offenses such as unpunctuality, insubordination and incivility to the public; Class 2 comprises negligence or misconduct leading to delay of trains or injury to property, while in Class 3 are placed offenses risking human life. The lists have met with a certain amount of criticism from opposite points of view. The trade union papers for instance, which object to fines altogether, protest against their amount and multiplicity, while the ordinary press rather objects to the inadequate punishment apparently imposed upon a man who risks human life. The whole subject is one likely to give the railroad managers trouble in the future; but so far we hear of no attempt to get along without fines at all, as nearly every road does here.

We should not for a moment think of advising our English friends to adopt an American custom in dealing with employees, for the differences in the conditions in the two countries are far more deep-seated than are the differences of opinion encountered in dealing with mechanical questions (which latter are often hard to settle); but the question of fines or no fines affects such a radical element in human nature, which is the same everywhere, that we are not sure but that an American, or even a Russian, might safely advise the English to abolish that method of discipline.

A fine for risking human life ought indeed to be more than \$5, if it is to be anything at all; but those who object to the smallness of this sum doubtless fail to realize how often a trainman or a signalman comes within an ace of doing something dangerous. This fine becomes a matter of less importance, however, when one reflects that any marked deviation from the rules of safety results in an absolute dismissal from the service. Fines for damaging property are almost always unsatisfactory. If adequate they swamp the employee. If within his means they do not give a true idea of the magnitude of the loss. Fines for mere infractions of discipline are attempts to measure moral elements in money. Without depending particularly on certain American experiences of the last three years, we feel safe in suggesting to any road, anywhere, whose employees are at all amenable to moral influences, a trial of the plan of imposing fines of all grades on paper only, as is done here on many roads with suspensions. That is, make a record of a man's defections, but reserve the infliction of the penalties until the accumulation of items shall indicate that he ought to be dismissed. Surely, no one will claim that money collected in fines is of much account to the railroad company.

Taxation of Express Companies on Interstate Business.

In another column we give a report of the recent important decision of the United States Supreme Court, in the Ohio (and Indiana) tax-law suits, which may seriously affect the express business not only in the states mentioned, but in all others, wherever the legislatures may feel like "striking" the express companies for more money. A perusal of the decision and of the dissenting opinion (or of our report, if we have succeeded in presenting all the essential points) will give the impression that this decision, like most of those that have prevailed by such a narrow majority, is a pronounced example of expert hair splitting.

As there is no appeal from this decision, probably there is little profit in discussing it, as far as the taxation of express companies is concerned, but as this five-to-four vote of the Supreme Court may prove to be one of the symptoms of a change in the attitude of the government toward those corporations which are popularly supposed to be accumulating wealth too rapidly, it will be worth while to study it a moment for the purpose of noting its tendency. Nothing is plainer than that human sympathy often rules,

where subtle distinctions are necessary, in the judicial as well as in the legislative branch of the government; and after examining the numerous decisions, pro and con, marshalled in these respective opinions, one still feels that he will commit no "contempt of court" if he concludes that five judges simply thought that express companies ought to be made to contribute more liberally to the support of government, and four thought that it would be better to let them go on as in the past.

For the references to past decisions that have hinged on the effect produced by laws, rather than on their language, tend to justify this view. The sleeping-car tax, as assessed on a mileage basis, was sustained because it was a light tax; but if a sleeping-car company hired its cars of the railroads its business would not be essentially different from what it is now, and then it would be in the same position as the express companies. But the Ohio tax on the express companies looks exorbitant, and so four judges believe it ought to be disapproved.

How would it be in the case of a railroad doing its own express business? The same amount of capital would be required for the same amount of business, and the amount of tangible property would not be materially different, but in that case the unit rule and mileage proportions would receive the approbation of the court without question. We do not see any reference to this point in the opinions, but in reason, if not in law, it is undoubtedly one of the strongest grounds supporting the majority opinion. The nature of the express business as essentially a branch of the railroad business is the best justification for taxing it in the same way that railroads are taxed. If the express companies make such a big profit in using a \$100 delivery horse that the animal can be taxed at \$2,000 and still not impoverish the company, perhaps that is presumptive evidence that the express company is floating too much capital; that a larger share of its earnings ought to go to the railroad company which carries the goods 100 miles to one mile traversed by the horse.

If there is ground for taxing railroad, telegraph, sleeping-car and express companies on different bases, it would seem, from the tenor of these opinions, that it should be found in the varying proportions in which the elements of (1) real estate, (2) personal property constantly moving over the line, (3) personal property remaining in one town, and (4) the franchise, or the right to do business, enter into the total revenue-producing value of the business as a whole. But, as in tax controversies everywhere, these proportions can never be computed with accuracy and they must therefore be settled by negotiation or compromise. There certainly is a great difference between a railroad whose plant costs \$200,000 a mile and which must make its living out of freight carried at very small profits, and an express company with no real estate, whose success depends chiefly on fidelity and skill and whose wages account is an enormously greater proportion of the total outlay than the railroad's ever can be. The express company may very plausibly claim that it ought to be classified with, say, a family physician or a traveling salesman, whose whole "plant" is in his head and whose franchise costs him practically nothing at all.

But express companies are taxed, and, like the man in jail, they probably take less interest, just now, in the ethical philosophy of their situation than in some means of getting the heavy hand of the sheriff or (tax-gatherer) taken off from them.

January Accidents.

Our record of train accidents in January given in this number, includes 51 collisions, 68 derailments and other accidents, a total of 119 accidents, in which 33 persons were killed and 100 injured. The detailed list, printed on another page, contains accounts only of the more important of these accidents. All which caused no deaths or injuries to persons are omitted except where the circumstances of the accident, as reported, make it of special interest.

These accidents are classified as follows:

COLLISIONS.	Rear	Butting.	Crossing and other.	Total.
Trains breaking in two.....	5	0	0	5
Misplaced switch.....	0	2	2	4
Failure to give or observe signal.....	2	0	3	5
Mistake in giving or understanding orders.....	0	1	0	1
Miscellaneous.....	3	3	3	9
Unexplained.....	13	5	9	27
Total.....	23	11	17	51

DERAILMENTS.	Total.
Broken rail.....	5
Loose or spread rail.....	4
Defective bridge.....	1
Defective switch.....	1
Defective frog.....	1
Bad track.....	1
Broken wheel.....	7
Broken axle.....	5
Broken truck.....	1
Fallen brakebeam.....	1
Misplaced switch.....	5
Runaway train.....	2
Landslide.....	3
Washout.....	2
Snow or ice.....	2
Malicious obstruction.....	5
Unexplained.....	20
Total.....	68

OTHER ACCIDENTS.	Total.
Boiler explosion.....	1
Cars burned while running.....	2
Various breakages of rolling stock.....	1
Other causes.....	3-7
Total number of accidents.....	126

A general classification shows:

	Collisions.	Derailments.	Other accidents.	Total.	P. c.
Defects of road.....	13	0	0	13	9
Defects of equipment.....	5	13	3	21	16
Negligence in operating.....	19	7	3	29	23
Unforeseen obstructions.....	0	14	1	15	12
Unexplained.....	27	20	0	47	36
Total.....	51	68	7	126	100

The number of trains involved is as follows:

	Collisions.	Derailments.	Other accidents.	Total.
Passenger.....	28	23	4	55
Freight and other.....	66	45	3	114
Total.....	94	68	7	169

The casualties may be divided as follows:

	Collisions.	Derailments.	Other accidents.	Total.
Killed:				
Employees.....	12	13	1	26
Passengers.....	2	0	0	2
Others.....	0	5	0	5
Total.....	14	18	1	33
Injured:				
Employees.....	30	27	1	58
Passengers.....	20	20	0	40
Others.....	0	2	0	2
Total.....	50	49	1	100

The casualties to passengers and employees, when divided according to classes of causes, appear as follows:

	Pass. Killed.	Pass. Injured.	Emp. Killed.	Emp. Injured.
Defects of road.....	0	8	1	5
Defects of equipment.....	0	0	1	12
Negligence in operating.....	2	25	16	31
Unforeseen obstructions and maliciousness.....	0	0	7	10
Unexplained.....	0	7	1	11
Total.....	2	40	26	58

Twenty-one accidents caused the death of one or more persons each, and 25 caused injury but not death, leaving 80 (64 per cent. of the whole) which caused no personal injury deemed worthy of record.

The comparison with January of the previous five years shows:

	1897.	1896.	1895.	1894.	1893.	1892.
Collisions.....	51	50	55	41	104	120
Derailments.....	68	78	67	69	157	117
Other accidents.....	7	5	7	6	12	12
Total accidents.....	126	133	129	116	273	249
Employees killed.....	26	40	23	16	38	46
Others killed.....	7	7	9	28	11	15
Employees injured.....	58	68	54	49	170	111
Others injured.....	42	51	46	80	159	152
Passenger trains involved.....	55	45	45	51	105	109

Average per day:

	1897.	1896.	1895.	1894.	1893.	1892.
Accidents.....	4.06	4.29	4.16	3.74	8.81	8.03
Killed.....	1.06	1.52	1.03	1.42	1.58	1.97
Injured.....	3.23	3.84	3.93	4.16	10.61	8.48

Average per accident:

	1897.	1896.	1895.	1894.	1893.	1892.
Killed.....	0.26	0.35	0.24	0.37	0.17	0.24
Injured.....	0.79	0.89	0.76	1.11	1.20	1.05

No passenger was killed in a passenger train accident in January, so far as we have been able to discover. The worst accidents to passenger trains were those at Shippenville, Pa., on the 23d, killing 4 employees, and at Skillman, N. J., on the 16th. The Shippenville accident was on a narrow gauge road. At Oakland, Cal., on the 19th, there was a collision, of a kind frequently occurring, in which two or three faults, each almost insignificant in itself served, when combined, to cause disaster. The engineman deliberately disregarded a signal, but under circumstances in which, doubtless, he had done the same thing before without harmful results. The signalman was new to the business, and the collision was, in a sense, due to the fact that he was inexperienced; and yet he seems to have done nothing contrary to the regulations. The other signalman, who tried to assist him by giving advice which was not asked for, was acting from the best motives, and yet his advice-giving will be looked upon by many as the essential cause of the collision. It would be easy enough to issue a rule forbidding communications from one signalman to another, except when made in strict accordance with the regulations; but such a rule could not be systematically enforced, and it might prevent as much good as harm.

The passenger-train accident at Carson, Ia., on the 5th, in which, like that at Skillman, fire was one of the elements of danger, has been noticed in a previous issue. The collision on the Brooklyn Elevated road on the 28th is one of the most startling that has occurred since elevated railroads came into use, although, fortunately, no passenger was killed. We believe that in all the 20 years or thereabouts that the elevated roads have been running in New York City no car of a passenger train has fallen into the street, even partially except in one instance; and the Brooklyn roads, with their smaller traffic and more limited experience, have, we believe, been free from such accidents up to this time. (The engine which tumbled off the end of a track in Brooklyn a few months ago was attached to an empty train.) Several of the men held by the coroner to be blameworthy in the case which occurred last month have been arrested on charges of manslaughter, but no trial has yet been reported. There was a derailment on the Manhattan at South Ferry on the 17th, which, though fortunately harmless or nearly so, drew attention to the possibilities of danger always present on an elevated road. The wreck of a bridge near Spartanburg, S. C., on the 25th, has been referred to in a previous issue.

A passenger train of the Intercolonial tumbled down a bank near Moncton, N. B., on Jan. 23, and two persons were killed and ten injured.

We have noted 12 accidents to street cars in the United States in January, in which one person was killed and 35 were injured. The fatal accident was a butting collision on an electric road, which has a double track, but was temporarily using a short piece of the road as single track. There was a runaway due to the failure of a brake chain, and two cases of malicious obstruction of the track. Aside from these the causes were of the usual kinds.

Annual Reports.

Northern Central.—The annual report of this company for the year ending Dec. 31, 1896, is issued under date of Feb. 17. The total miles operated were 377. The general results of operation were:

	1896.	Inc. or Dec.
Gross earnings.....	\$5,286,602	D. \$219,426
Working expenses.....	4,643,104	I. 44,586
Net earnings.....	\$81,643,497	D. 264,012

The decrease in passenger earnings was about \$39,000, or 3.44 per cent. The decrease in freight earnings was \$143,358, or 2.919 per cent. The passenger-miles were 51,156,008, the decrease having been 1.53 per cent. The total passengers carried were 3,848,833, having decreased 6.41 per cent. The rate per passenger-mile was 2.14 cents, having decreased from the previous year 0.042 cent, or 1.92 per cent. At the rate received the company estimates a loss of 0.01 cent per passenger-mile. The year before there was a profit of 0.041 cent.

The ton-miles were 885,552,906. This showed an increase of 1.127 per cent over the previous year, but the rate was less, namely 0.538 cent per ton-mile, being a decrease of 0.023 cent, or 4.1 per cent. The result, as stated above, was a loss of \$143,358 in the gross freight earnings. At the rates received, the estimated profit on a ton mile is 0.138 cent; the year before it had been computed at 0.163 cent.

After having paid interest, rentals, taxes, etc., the balance to the credit of income account was \$603,858, out of which dividends of seven per cent. were paid. The capital account was increased \$249,009, of which \$184,000 was expended on equipment, being freight cars.

The earnings per mile of road amounted on the main line (148 miles) to \$27,570 a mile.

The work of renewing bridges and trestles was continued, an aggregate of 794 of Howe truss and other bridges having been replaced by permanent structures. Some work was done at the Canton terminals and a new freight yard was opened in Baltimore.

St. Louis, Vandalia & Terre Haute.—This company reports for the year ending Oct. 31, 1896. The gross earnings were \$1,613,639, a decrease of 7.5 per cent. from the previous year. This was mostly in freight, the earnings from which amounted to \$929,245, and decreased 12.21 per cent. There was a small increase from passenger earnings. The earnings per mile of road were \$10,194. The decrease in freight earnings was the result of a smaller tonnage carried and a shorter average haul, which was partially offset by a slightly greater rate per ton. The average rate per ton-mile in 1896 was 0.856 cent; the year before it had been 0.838 cent. The large decrease in tonnage and revenue is attributed mainly to the general depressed condition of the business of the country. The increase in passenger earnings was almost wholly due to the greater number of passengers carried and to somewhat longer journey, the average rate having been slightly reduced. This was, in 1896, 2.354 cents as against 2.38 the year before.

NEW PUBLICATIONS.

A Railroad Dictionary.—Mr. Lucien Serraillier has compiled and Messrs. Whittaker & Co., London, will shortly publish, a "Technical Railway Vocabulary," giving over 5,000 French, English and American technical terms used in railroad management, construction and working. The book is destined for the use of engineers, railroad men, contractors, company directors, financiers, lawyers, patent agents and inventors.

TRADE CATALOGUES.

Electric Street-Car Trucks.—The McGuire Manufacturing Co. has just issued a catalogue presenting illustrated descriptions of many styles of trucks for street railroads. The A1 suspension truck, Columbia truck, adjustable traction truck, pivotal motor truck. "L" truck and the grip truck are each considered. The McGuire safety brake shoe, the elastic brake hangers, the pipe trussing for open cars and the ratchet-brake handle are also carefully described and fully illustrated. The Columbia magazine street-car heater is also referred to and a test made by Mr. M. K. Bowen is recorded, showing the relative cost of heating an 18-ft. car by stoves and by electric heaters. According to these figures, the total cost of heating a car for 18 hours to a temperature of 35 deg. Fahr. above the outside temperature is 10.48 cents when using the Columbia hard-coal stove, and 95.90 cents when using six electric heaters consuming in all 6.2 amperes.

The 1896 Traffic at the Sault Ste. Marie.

Col. Lydecker, Corps of Engineers, U. S. A., has submitted the annual report of the water-borne traffic through the "Soo" in 1896. Extracts follow:

I submit herewith a tabulated statement of water traffic to and from Lake Superior during the season of 1896. The statement includes traffic through the Canadian canal at Sault Ste. Marie, as well as that of the United States canal, arrangements having been made with those in control of the Canadian work for an exchange of statistics on the same form as that heretofore used in our own reports. The United States canal was opened for the season of 1896 on April 21, and closed Dec. 8, the old (Weitzel) lock having been in use throughout this period, and also the new 800 ft. (Poe) lock after Aug. 3; the total period of navigation through this canal was 232 days, or one more than during the season of

1895. The Canadian canal was operated from May 7 to Dec. 10, covering a period of 218 days as compared with 87 days during the preceding season, when it was first opened to traffic.

The total freight through both canals during the season of 1896 was 16,239,061 net tons, exceeding all previous records by nearly one and a quarter millions of tons. But there was a reduction of 3,283,556 tons in the freight passing the United States canal as compared with that for the season of 1895, a result evidently due to the fact that the Canadian canal has not heretofore participated in traffic during an entire season of navigation. It is probable that this reduction would have been less if the most deeply loaded vessels had not found it expedient to select the Canadian route up to Aug. 3, 1896, when the Poe Lock was first opened to commerce, as our detailed records show that 34 per cent. of the freight that passed until that date went through the Canadian Lock, but only 22 per cent. after it.

The noticeable items of increased freight are nearly half a million tons of soft coal, or 23 per cent. more than in 1895; about 17,000,000 bush. of wheat, an increase of 37 per cent., and over 19,000,000 bush. of grain other than wheat, being an increase of 230 per cent. The items in which a decrease is shown are: Hard coal, 10 per cent.; salt, 12 per cent.; iron ore, 2 per cent.; lumber, 8 per cent., and building stone, 26 per cent. But the aggregate in tons of this decrease is quite insignificant when compared with the total service.

We have not yet been able to obtain the information necessary for computing the value of freight involved in this commerce with respect to prices current during the past season, but estimating it by the same unit prices as were used for the season of 1895 it would aggregate \$186,153,429.20, an increase of \$26,578,299.77, as compared with that year.

The growth of commerce through the river is indicated by the following:

Total freight during season of—		Tons.
1881.....		1,567,741
1890.....		9,011,213
1895.....		15,062,280
1896.....		16,239,061

Items.	Traffic for 1896.		Total traffic for season of—	
	United States canal.	Canadian canal.	1896.	1895.
Vessels.....number	13,441	5,174	18,615	17,956
Lockages.....	6,423	3,043	9,466	7,734
Tonnage, registered, net tons.....	12,896,588	4,352,430	17,249,018	16,876,781
Tonnage, freight, net tons.....	11,679,021	4,560,037	16,239,058	15,062,580
Coal, hard.....net tons	282,468	114,741	397,210	446,477
Coal, soft.....	1,781,545	845,585	2,626,130	2,133,885
Flour.....bbls.	7,073,174	1,809,681	8,882,855	8,902,302
Wheat.....bush.	41,151,599	19,104,861	60,256,460	46,218,250
Grain, other than wheat, bush.....	21,158,325	6,289,746	27,448,071	8,328,694
Iron ore.....net tons	5,402,166	2,507,084	7,909,250	8,062,269
Lumber.....M. feet, B M	658,610	26,346	684,956	740,700
Unclassified freight, net tons.....	420,802	100,049	520,851	463,308

A Decade in Railroad Regulation.*

It is 10 years since public dissatisfaction with methods of railroad administration found legislative expression in the passage of the Interstate Commerce Law. . . . The only subject of disagreement which constituted an at all adequate cause was the charges exacted for carrying passengers and property. Much of this complaint was unjust to the railroads and arose through the fact that considerable industry was conducted at a loss that might have been shifted to railroad corporations could low enough charges for the movement of agricultural products have been secured; yet there had been many instances of grievous injury to individuals and communities through unjust discriminations in rates. The extent to which the Interstate Commerce Law has served to eradicate these discriminations must be the measure of its success. . . .

Charges may unjustly discriminate between individuals, classes of traffic or communities. . . . Discriminations between individuals have become less frequent, but they continue; and it is not certain that they are not more harmful at present than when more common. . . .

Unjust discriminations prejudicial to particular commodities have not been materially reduced in number by the operation of the law. . . .

The most serious class of discriminations includes those which have for their victims the entire populations of towns, cities and even extensive districts. . . . To attempt to regulate these cases by the process of taking them up singly and prescribing the alterations necessary to make the charges relatively reasonable is an impracticable task. Even had the Commission the authority of a United States Court and were there no appeal from its decision, the town with two railroads would still have an immense advantage over that with one. . . .

When Commissioner Knapp declared, "The power to compete is the power to discriminate," he expressed most tersely that Congress in attempting to perpetuate competition and at the same time forbid the acts by which competition is made effective had made a law that could not be enforced. In fact, the unreasonable rate not made to secure competitive traffic or to recoup losses from carrying such traffic at too low rates is practically unknown. The conflict of interest real or fancied between the several corporate units that make up the railroad system is the primary cause of the evils now apparent. Hence the anti-pooling clause of the Interstate Commerce law is radically antagonistic to any wise system of railroad regulation. It is necessary at the outset, as a first step toward a system under which railroad rates can be made equal to all, that this

*Extracts from paper by Mr. H. T. Newcomb, U. S. Department of Agriculture, read before the ninth annual meeting of the American Economic Association, Baltimore, Dec. 31, 1896.

restraint upon the carriers should be removed. But this is a mere beginning toward enlightened methods of dealing with the transportation problem. The force that tends toward the consolidation of railroads is powerful and beneficent. All provisions forbidding or hindering the various forms of consolidating parallel or connecting railroads should be repealed, and public sentiment should combine with legislative enactment to encourage every step that leads toward complete harmony of the railroad system.

TECHNICAL.

Manufacturing and Business.

Samford Keeler has been appointed to represent the Nathan Manufacturing Co., of New York City, in Chicago, succeeding George Royal, now deceased. Mr. Keeler was long identified with the Flint & Pere Marquette Railroad, and other important railroad interests in the Northwest, and is a man of extensive railroad experience.

William E. Corey has been made General Superintendent of the Homestead plant of the Carnegie Steel Co., to succeed C. M. Schwab, now President. George H. Wightman will have general charge of the sales department of the company's business. Mr. Corey has been Superintendent of the Armor Plate Department and Mr. Wightman has been called from the head of the Boston branch office of the company.

W. K. Stansbury, Mayor of Middletown, N. Y., has received the appointment as General Manager for Richard Dudgeon, manufacturer of hydraulic jacks, 24 Columbia street, New York City.

The Eclipse Switch & Signal Co., of Elmira, N. Y., has organized and taken out a charter under the laws of New Jersey. The capital stock is \$250,000. The company has manufactured electric automatic blocking and interlocking apparatus, pressed steel poles and semaphore signals for some time past and has been known as the Switch and Signal Department of the Eclipse Company, large manufacturers of bicycles, at Elmira. The company has rented a building at Elmira for the purpose of exhibiting its several devices.

The Ingersoll-Sergeant Drill Co., of New York City, is now operating its plant at Easton, Pa., eight hours a day, five days a week.

The Edison Electric Illuminating Co. of New York has just awarded to the Southwark Foundry & Machine Co., of Philadelphia, a contract for two new electric lighting engines for its Pearl street station. They will be of the same type and size as those last installed, four-cylinder quadruple-expansion marine type and about 2,500 H. P. each.

The foundry and other real estate of the R. F. Hawkins Iron Works at Springfield, Mass., are to be sold at auction by the mortgagee, the Hampden Savings Bank, on March 17.

The Laconia Car Co., of Laconia, N. H., which was recently taken out of the hands of Receivers and turned over to Dennis O'Shea, assignee, has been ordered sold by Judge Fellows, of Tilton, N. H., March 11, unless previously disposed of at private sale.

Safety hollow staybolt iron, manufactured by the Falls Hollow Staybolt Co., of Cuyahoga Falls, O., has been specified in locomotive boilers for the International & Great Northern, now being built by the Richmond Locomotive & Machine Works.

The Southern Railway has awarded a contract to the Lenoir Foundry Co., of Lenoir City, Tenn., for furnishing all of the iron castings for cars and locomotives that will be required at the Knoxville shops of the road for the 12 months commencing Feb. 1, 1897.

The Berlin Iron Bridge Co., of East Berlin, Conn., has received a contract for furnishing the steel work for the Odd Fellows' Building at Attleboro, Mass. The company is also offering for sale three different buildings for which it prepared the steel work and which are suitable for foundries, machine shops, or, with some slight changes, for car barns. The parties ordering these buildings failed to raise the money to pay for them.

In the United States Circuit Court at Albany last week, Judge Cox rendered a decision in favor of the plaintiff in the case of the Dewey Electric Heating Co. against the Albany Street Railroad Co. The former concern, which is owned by the American Heating Corporation, claimed that a switch used in connection with street car heaters on the Albany Street Railroad, and manufactured by the Consolidated Car Heating Co., of Albany, was an infringement on its patents. It is stated that the suit affects all the installations heretofore made by the Consolidated Car Heating Co., and also affects all other manufacturers of street car heaters who have been using this switch.

At the annual meeting of the A. & P. Roberts Co. (Pencoyd Iron Works) Percival Roberts was re-elected President, P. W. Roberts Treasurer and Frederick K. Snare Secretary.

S. C. Munoz, of the Heine Boiler Co., and E. C. Darley, late of the Rankin & Fritsch Engine Co., of St. Louis, have formed the firm of Munoz & Darley, with office in the Rookery, Chicago, and will act as Western representatives of the Cahall vertical and Cahall-Babcock & Wilcox boilers, manufactured by the Altman & Taylor Machinery Co., of Mansfield, O.

The Kalamazoo Railroad Velocipede & Car Co., of Kalamazoo, Mich., has received an order from the Mount

Penn Gravity Railroad of Reading, Pa., for one 20-ft. gasoline motor pleasure car, capable of carrying 25 persons.

It is stated that the Osborn-Sager Co. will erect a large two-story car and repair shop at West Newton, Pa. It will build and repair all its own cars, including both pit and railroad.

Iron and Steel.

The Ohio Steel Co., of Youngstown, has commenced the construction of its 10 new open-hearth furnaces. The work is being pushed with all possible haste. The plant is now running double time in all departments.

A charter was granted at Harrisburg, Pa., Feb. 23, to the Farson Mfg. Co., of Chester, to manufacture iron and steel. Capital, \$40,000. Directors, H. C. Farson, Enoch S. Farson, Annie J. Farson, Geo. S. Capelle and Oliver B. Dickinson.

Six mills of the Apollo (Pa.) Iron and Steel Co. at Apollo resumed operations last week.

The Bethlehem Iron Co., on Feb. 20, shipped via New York, 24 carloads of armor plate for Sebastopol, for the new battleship Rostislav. The shipment weighed 538 tons.

Atlantic Furnace, of the Atlantic Iron & Steel Co., Newcastle, Pa., has been blown in after an idleness of several months. The Greenville rolling mill, leased by the company at Greenville, Pa., has resumed operations, giving employment to 300 men.

New Stations and Shops.

The new passenger station of the Gulf, Colorado & Santa Fe at Galveston, Tex., now under construction, will be four stories high and will cover an area of 100 x 120 ft. It will be of stone, with red pressed brick and terra cotta trimmings. The three upper floors will be used for the offices of the company. The general plan of the buildings was designed by C. W. Felt, Chief Engineer of the road, and the architectural features by A. J. Armstrong, the company's architect. The contract calls for its completion by July 20.

Interlocking.

The National Switch and Signal Co. has contracted to furnish for the Philadelphia & Reading the interlocking switches and signals for the new four-track depressed line to be constructed in Pennsylvania avenue, Philadelphia.

Bessemer Steel in 1896.

The statistics of Bessemer production compiled for the American Iron and Steel Association by Mr. Swank have been made public, and we are pleased to see that the announcement of the total output of rails for the year, as published in our issue of Jan. 8, was almost exactly correct; that is, it was 1,192,892 gross tons. Our statement was that it was about 1,100,000. Of course we were indebted to Mr. Swank for that preliminary estimate. We observe that for some reason the figure very commonly used in the recent writing on this subject is 800,000. The total production of Bessemer ingots was 3,919,906 gross tons, against 4,900,128 tons in 1895, which last figure, by the way, was the largest in the history of the industry in this country.

Boiler Inspection and Boiler Explosions in 1896.

The Locomotive for February, published by the Hartford Steam Boiler Inspection & Insurance Co., contains a comparison of the work done by the inspectors during the years 1895 and 1896, as follows:

	1895.	1896.
Visits of inspection made.....	98,349	102,911
Whole number of boilers inspected.....	139,907	205,957
Complete internal inspections.....	78,744	78,118
Boilers tested by hydrostatic pressure.....	8,373	8,187
Total number of defects discovered.....	144,857	143,217
" of dangerous defects.....	14,556	12,988
" of boilers condemned.....	799	663

Of the total number of defects for the year 1896 11,651 resulted from cases of deposit of sediment and 25,619 from incrustation and scale. The number of explosions last year was 346. The persons killed from these explosions was 382; persons injured, 529; total killed and injured, 911. The number killed in 1895 was 374. It will be seen from the above figures that while the number of boilers examined last year was about 3½ per cent. more than was examined in 1895, about 17 per cent. more boilers were condemned in 1895 than in 1896 and the number of persons killed last year was about 2¼ per cent. more than the number killed in 1895. Of course this proves nothing either as to the vigilance of the inspectors or to the quality of the boilers inspected, but simply indicates that the boilers were found in a better condition last year than they were in 1895.

Dredging the Delaware River.

The silt which has been accumulating in the Delaware River at the head of the estuary for centuries and which has limited the draught of vessels passing over the Dan Baker and Duck Creek shoals to 20 ft. mean low water, is to be removed. These two bars cover a length of between seven and eight miles of channel and have constituted a serious obstruction to the navigation of the river for many years, yet no effort has been made to remove them until now. The Trades League of Philadelphia has persistently advocated the beginning of the work at the mouth of the river proceeding continuously up stream to and above the harbor at Philadelphia. It is estimated that about 3,000,000 cu. yds. must be removed to create the requisite channel, 26 ft. deep and 600 ft. wide. This material is to be redeposited in the river between Stony Point shoals and the New Jersey shore below Alloways Creek, and the work is to be completed by Dec. 31 next. The bids were as follows: Morris & Cummings Dredging Co., New York City, 8½ cents;

American Dredging Co., Philadelphia, 9 $\frac{1}{2}$ cents; Baltimore Dredging Co., Baltimore, Md., 10 $\frac{1}{2}$ cents; Atlas Dredging Co., Wilmington, Del., 11 cents. The bid of Morris & Cummings was recommended for approval. The total cost will be about \$265,000 and the average amount of dredging 13,333 cu. yds. per working day.

The St. Louis Knuckle Litigation.

We have the following letter, signed by Mr. Harrison, Second Vice-President of Shickle, Harrison & Howard: "In your issue of Feb. 12, on page 118, is a paragraph in relation to the litigation of the St. Louis Car Coupler Company with ourselves, in which we find the following surprising statement: 'This Court has stayed the mandate until March 10, which continues the injunction in force against the Shickle, Harrison & Howard Iron Company.' If you will consult an attorney we think he will advise you that this statement is incorrect. We are to-day selling St. Louis knuckles, and have been since the decision of the Court of Appeals."

B. & O. Improvements.

Some important improvements in alignment and grade are now being made on the line of the Baltimore & Ohio, between Tabb's Station and North Mountain, in West Virginia. The reader will remember the improvements at Seven Curves, some miles east of Cumberland, lately described by us. The work at Tabb's Station and its vicinity is not quite so extensive. At Meyer's Hole, a depression one mile east of North Mountain Station, with descending grades of 42 ft. per mile on either side, the grade is being raised about 15 ft. at the lowest point still leaving some depression. At the same time, the line is being straightened, some 70 deg. of curvature being taken out in a distance of 3,500 ft. Meyer's Hole has been a source of expense in the past, and there have been serious wrecks there. By the change of alignment and grade, it is hoped that the danger will be eliminated. It is, moreover, estimated that the saving in expenses effected by this change, based upon the present traffic on the line, will amount to \$7,000 a year. At Tabb's and Tabb's Summits, the grades are being reduced from 42 ft. per mile to 11 ft., and the alignment considerably bettered. The change at both places takes out all the 42 ft. grade with the exception of some at the east side of Tabb's, where only a portion is removed, there being a long descending grade eastward toward Martinsburg. At both these points the summits are being lowered about 12 ft. each, and in order to make the excavation and run the new line it requires considerable work to keep the traffic moving, as the new line crosses the old at several places. The saving in operating expenses, when these summits are lowered upon the basis of present traffic, is believed will be \$10,000 a year. The work is being done under the supervision of Chief Engineer W. T. Manning.

Wheels Drawn For Thin Flanges.

In Mr. Tattnell's paper on Mounting Car Wheels, read last week before the New York Railroad Club, are some statistics of the proportion of wheels condemned for thin flanges. He got facts from 27 principal railroads. Out of all the wheels drawn the percentage condemned for thin flanges ran all the way from 11 up to 54 per cent. This last percentage was from one of the principal trunk lines, on which a total of 21,710 wheels from one maker were removed from passenger service, 6 per cent. of which were thin flanges, while of 26,418 wheels from the same maker removed from freight service 54 per cent. were for that cause. This difference is explained by the fact that in the fast passenger service the use of the quick-acting air-brake develops defects other than thin flanges. A total number of 416,000 wheels were reported to him, and the average percentage of those drawn for thin flanges was 23.5.

The Standard Railroad Signal Company.

This company has taken a contract for a large interlocking plant at Hamilton, Ont., on the Toronto, Hamilton & Buffalo road. It also has the contract for a plant of considerable size at Brockton, Mass., on the New York, New Haven & Hartford and for several smaller ones on the Erie road.

The Standard Company, which was organized by Henry Johnson and John T. Cade about a year ago, and which began business on a small scale at Rahway, has now removed to more commodious quarters at Arlington, N. J., taking the buildings lately occupied by the Becket Foundry & Machine Co. Arlington is on the Greenwood Lake division of the Erie, about eight miles from New York.

THE SCRAP HEAP.

Notes.

Lake Shore elevator A at Toledo was burned on the night of Feb. 19, together with seven loaded cars. Loss, \$275,000.

The Missouri, Kansas & Texas now runs its passenger engines through between Denison and Parsons, 274 miles, though the men change at Muscogee, the same as heretofore. Seven engines now do the work formerly performed by 11, and the four engines relieved are used for fast freight.

Southern papers have recently reported that the Southern Railway would discharge all the negroes in its train service, on account of the feeling among the labor unions that white men were not having a fair chance; but an officer of the road informs us that the subject has received no consideration and that no change is intended.

The agitation in favor of a federal law prohibiting brokerage in tickets is being kept up without abatement. Mr. Roach, of the New York Central, and Mr. Morse, of the Southern Pacific, went to Washington and report that they found from the *Congressional Record* that there had been sent in 2,000 petitions in favor of the bill and only 78 in opposition to it. John A. Lee, Treasurer of the Commercial Travelers' Protective Association, sent to Congress a long protest against the bill.

Great damage was done by floods on Feb. 22 and 23 in the Ohio and Potomac valleys, but we have seen no definite accounts of the loss of important railroad bridges. Two trestles were reported washed away near Knoxville, Tenn. At Cincinnati several of the roads had their entrance to the central passenger station cut off. Railroad tracks were submerged at many places in the region of Pittsburgh. On the Baltimore & Ohio, east of Cumberland, the main tracks were in some places submerged to a depth of 10 ft.

Employees' Good Records on the L. & N.

The Louisville & Nashville has now had Brown's discipline in force for more than a year, and the report of Assistant Superintendent B. M. Starks, of Birmingham, containing the names of the engineers, conductors, flagmen, brakemen and firemen on his division who have made clear records for a year has been published in the *Birmingham News*. The number of names appearing in the list is 233, while the number of discipline bulletins issued during the year was 224. Mr. Starks makes special mention of R. E. Livingston, a conductor who succeeded in detaching from his train a burning car of hay at the risk of his life, and Fireman Allen Porter, who, when a collision occurred near the wrecked Cahaba River bridge (the next day after the bridge disaster), succeeded, by his presence of mind in putting on steam, in preventing his locomotive from falling into the chasm.

A Railroad Rogue.

Mr. J. T. Ford, General Manager of the Cartagena-Magdalena Railroad, writes to us from Cartagena, Colombia, warning American railroad men against a trainmaster and two other employees who have left that road after stealing a large amount of money from a mail train. The trainmaster is named W. Riley Mansfield, and his accomplices were F. H. Merrill and a man named Davidson. The robbers failed to select the train they wished to get at (one which carried a large quantity of gold bars) and secured only about \$4,000. With this they got away and went to Curacao, and it is supposed they are now on the way to the United States. Mansfield has relatives in Lebanon, N. H. Mr. Ford sends us a photograph showing Mansfield and Merrill, but it is not sufficiently distinct to be reproduced. Mr. Ford says that it is practically impossible to get honest men from the United States to work in Colombia, and he has about concluded to try to get along with natives.

The Manchurian Railroad.

According to the St. Petersburg correspondent of *The Times* (London), a commission of engineers who are now holding sittings in the Russian capital, discussing technical questions concerning the construction of the Manchurian Railroad, will leave for Manchuria about the middle of next month and spend the remainder of the year in completing surveys. There will be considerable tunneling at both ends of the line, especially on the eastern section towards its junction with the Ussuri branch of the Siberian Railroad. The actual construction of the line is not likely to be commenced before 1898. The Eastern Chinese Railway Company is contracting for about 15,000 tons of rails annually during six years, and will probably order several steamboats and a large number of barges for the River Sungari. The increased number of boats belonging to the two Amur steamship companies are still unable to cope with all the demands created by the new situation. The Sungari, if not too shallow for heavy goods, would be the best channel for transporting material from the Amur on to the route of the line through Manchuria. If possible, the Manchurian line will be begun at both ends, but unless the Sungari can be used as suggested there will be some difficulty in getting the necessary material on to the spot, especially as the Transbaikian section of the Siberian Railroad, of which the Manchurian line will be a continuation eastwards, will not be completed for some time to come.—*Transport*.

Lectures on Locomotives.

Mr. Richard A. Smart, Instructor in Experimental Engineering, Purdue University, lectured on the development of the locomotive before the students of the Chicago Manual Training School, Feb. 15, and on the following day the same lecture was given at Armour Institute. The lecture is one of a series which Mr. Smart has prepared covering variations in the design and construction of locomotives and illustrated by a stereopticon. These are delivered weekly to the seniors in mechanical engineering at Purdue University. The lecture given at Chicago follows the development of the locomotive from the earliest forms in England and America up to the present time. Many of the older types were photographed by Mr. Smart in the museums where they are now preserved and the illustrations of the erection of a large consolidation locomotive works, with many other views, were obtained in the same way.

Stereopticon lectures are to be an important feature of a course in railroad engineering at Purdue University, and the work now being done along this line is only preparatory to more complete plans for the following year. Prof. W. F. M. Goss has prepared for the students this year illustrated lectures covering the performance of locomotives; Mr. Smart will talk on car construction, signaling and railroad equipment, and Professor Stone, of Purdue, will give similar lectures on the chemistry of materials used in the construction of railroads and railroad equipment. Next year, in addition to these subjects, other lectures will be presented by prominent men, engaged in active practice, dealing with railroad subjects both from the mechanical standpoint and also that of economic management.

Annual Report, Union Switch & Signal Co.

The company reports for the year 1896:

Sales	\$582,708
Disbursements	483,179
Net	\$99,529
Dividends	25,796
Balance	\$70,633
The assets are given as \$1,861,161, including \$1,105,273 of	

patents. There was applied to reduction of patents during the year \$100,000 and \$28,298 was charged to reduction and expenses prior years, reducing the surplus of \$259,780 on Dec. 31, 1895, to \$130,852, to which the balance of \$70,633 for 1896 was added, making \$201,485 surplus Dec. 31, 1896.

Railroad Concessions in Nicaragua.

A letter from Consul O'Hara, of San Juan del Norte, appears in the advance sheets of the February consular reports, under date of Dec. 21, 1896, in which he writes that Alfred Raymond Fornaris, a citizen of the United States, has been granted a concession to construct and operate a steam tramway from the town of Bluefields to the Bluefields custom-house, at the mouth of the harbor. The concession was granted Nov. 3, 1896, and is published in *Diario Oficial* of Dec. 6. A concession to build and operate a railroad between Rama and San Ubaldo was granted Nov. 12, 1896, to Henry A. Barling and Frank H. Davis, citizens of the United States. This concession also appears in full in the *Diario Oficial* of Nov. 24. It is rumored that a contract to deepen the harbor entrance at San Juan del Norte has been let to Frank E. Keen, a British subject. Mr. Keen has represented that, with but little outlay, the harbor may be opened to vessels drawing 18 ft. He is not an engineer. The concessions mentioned have not been ratified by the Congress, but will be ratified as a matter of course. So little has ever been done in Nicaragua, says the Consul, under any government concessions, big or little, that it seems a waste of time to enter into the details of any concession without positive proof that it is to be pushed. Mr. Barling says that the Rama-San Ubaldo Railway will be built. His address is Rivas, Nicaragua. Mr. Fornaris lives in Bluefields and Mr. Keen in San Juan del Norte.

Lake Shipping News.

The Milwaukee Dry Dock Co. is enlarging its dock to 450 ft. in length.

The steel steamship being built at Detroit for the Bessemer Steamship Co., the eighteenth of the fleet, is to be named W. L. B. Jenney, after the Chicago architect of that name who is identified with the steel skeleton style of lofty building construction.

Preliminary work for a second dry dock by the American Steel Barge Co., at the head of Lake Superior, is under way. It will be completed in 1898, and will be 450 ft. long, 100 ft. wide, with a capacity of 19 ft. of water at the gate. The same company will also soon launch three vessels, one new and two that have been enlarged.

There is now afloat at Chicago about 5,000,000 bu. of grain, about 2,000,000 bu. less than a year ago. There is very little afloat at Duluth and only about half as much in elevators as a year ago. Practically all the wheat in Duluth is now sold for export at the opening of navigation, and most of it is contracted to Buffalo at 2 cents a bushel.

The Cleveland Ship Building Co. will commence work this month upon its new shipyard and dry dock at Lorain, O. The plant is designed to permit the building of four steamers at the same time. The drydock will have a total length of 559 ft., a width at base of 56 ft., and a 60-ft. gate, and will be the longest dry dock on the lakes. James Ritchie, Hickox Building, Cleveland, is Chief Engineer of the work.

The Great Northern road is considering the erection of a 2,000,000 bu. grain elevator at Buffalo. The project, if carried out, will affect the elevator interests at Buffalo, which have been pooled in an arrangement that has kept rates pretty stiff. It is proposed to build the elevator of steel. Up to this time no grain elevator of more than 350,000 bushels capacity has ever been built of steel. There are a number of small steel grain elevators in the Northwest built very recently, but all the larger ones are of wood. It is stated that this Buffalo elevator is to be built largely for use in connection with the Great Northern's Norfolkline into the southwestern country.

They Have Them in Texas Also.

A person visiting the Grand Central depot yesterday would, at a glance, have imagined that Ticket Agent Simmons was holding a levee, judging from the number of gentlemen seen in his office. But such was not the case, those present being a certain class of gentlemen who call on ticket agents without being asked, walk in and take charge of the office and demand what cash is on hand, the same as if it belonged to them, and they are not bank robbers either. This class of gentlemen are called traveling auditors, who never send a card in advance announcing their coming, but just naturally walk in when least expected and sometimes not wanted. Mr. Simmons' callers were a crowd, there being seven in this bunch. As the Grand Central is a depot where several lines center, an auditor for each road was represented, comprising the Houston & Texas Central; Texas & New Orleans; Galveston, Harrisburg & San Antonio; San Antonio & Aransas Pass; Gulf, Colorado & Santa Fe; Houston East & West Texas; Galveston, La Porte & Houston and the Pullman Car Company. He was not informed when they would call again.—*Houston Post*.

The Aesthetics of the Railroad.

A newspaper dispatch says that the coming spring will show a great improvement in the appearance of the New York Central Railroad; that orders have been issued to replace, as far as possible, board fences with woven wire fences, also to dress and seed the slopes and generally to try to bring up the appearance of the roadway to the best practice.

We are officially informed that no new or special orders have been issued with regard to this. For some time past the New York Central has been using the Page woven wire fencing quite largely as being not only efficient, but neat in appearance. It has also been the practice of the company for several years to do considerable work in dressing up slopes of embankments and cuts and cultivating grass plots and flower beds on vacant spaces. For a year or two past greenhouses have been maintained at Poughkeepsie and Batavia for propagating plants and flowers and caring for them during the winter. It has been an understood thing in the road department for several years that as much work should be done every summer as could be done without interference with more material interests in the way of generally making the appearance of the property more attractive.

CAR BUILDING.

The Missouri Car & Foundry Co. has received an order from the Kansas City, Pittsburgh & Gulf for building 400 box cars.

The United States Car Co. has received an order from the Commerce Despatch Line to equip 200 of its cars with new roofs. The work will be done at the Hegewisch works.

The Delaware, Lackawanna & Western has placed an order with the Jackson & Woodin Mfg. Co., Berwick, Pa., for building 300 box cars. The Dickson Mfg. Co., of Scranton, Pa., will furnish all the axles for these cars.

In the New Haven shops of the New York, New Haven & Hartford six passenger cars are being fitted with motors preparatory to their use between Hartford and New Britain. They will be ready in two or three weeks, and will be capable of hauling from four to six loaded passenger cars.

BRIDGE BUILDING.

Albany, N. Y.—A bill has been passed by the Senate granting the Common Council of this city power to build the Knox street viaduct, at a cost not to exceed \$50,000.

Avonmore, Pa.—The contract has been awarded by the Commissioners of Westmoreland and Indiana counties for a joint county bridge across the Kiskiminetas River. It will be a 4-span iron structure and will cost \$27,000, each county paying \$13,500.

Buffalo, N. Y.—It is said that bids are wanted March 2 for the superstructure of a viaduct over the railroad on Smith street. Edward B. Guthrie, Chief Engineer, Bureau of Engineering.

Chattanooga, Tenn.—The President has approved the act authorizing the construction of a bridge across the Tennessee River, near here, by the Chattanooga Western Railroad.

Cleveland, O.—The statement in our issue of Feb. 12 regarding the swing bridge, building at Willow street, was somewhat in error. Instead of Messrs. G. P. Nichols & Bro. being the contractors for the design and erection of the operating machinery, they are simply the contractors under the King Bridge Co. for the erection of this mechanism. The design is that of Mr. M. E. Rawson, City Engineer.

Easton, Pa.—A committee of Councils met representatives of the Lehigh Valley, the Easton & Northern and the New Jersey Central roads last week and made a request of the companies to build bridges over the Easton & Northern and Jersey Central tracks where the extension of Jefferson street would cross these railroads. The Easton & Northern is asked to build one bridge (estimated cost \$1,100) and the Central two bridges (estimated cost \$1,700), so as to avoid dangerous crossings.

Glens Falls, N. Y.—The contract for a bridge over the Glens Falls feeder of the Champlain Canal, at Glen street, has been awarded to the Hilton Bridge Construction Co., Albany, N. Y.

Hogansburg, N. Y.—A bill has been introduced in the Senate, providing for the building of a bridge across the St. Lawrence River, by the Northern Railway. The site is from a point on the river near here to the island of Cornwall, near the town of Cornwall, in Ontario.

Lecompton, Kan.—The House has passed the bill, authorizing the Douglas and Jefferson counties to issue bonds for the construction of a bridge across the Kaw River at this point.

Miller's Falls, Mass.—Bids are asked until March 10 for building an iron and steel bridge, and stone abutments for the same, across Miller's River, at this place. Plans and specifications may be seen at the office of Charles J. Day, Greenfield, Mass., and at the office of J. R. Worcester, 53 State street, Boston.

Moundsville, W. Va.—It is said that work will commence as soon as the weather permits on a new steel bridge at this place for the Ohio River Railroad, to replace the one carried away by the flood of last July.

Ottawa, Ont.—The Roads and Bridge Committee of the Carleton County Council has decided to rebuild the bridge over the Goodwood River in Nepeau Township.

Pittsburgh, Pa.—The announcement has been made that a Board of United States Engineers will convene here March 17 for the purpose of viewing certain bridges over the Ohio and Monongahela, and to hear all who may desire to make statements concerning the necessity of making changes in those structures. The bridges in question are the Panhandle's bridge at Steubenville, O., the Baltimore & Ohio's bridge at Bellaire, O., bridge at Troy street, and bridge at Tenth street, this city. The notice states that the Secretary of War believes these bridges to be unreasonable obstructions to navigation, and it is proposed to require that they be remodeled by March 17, 1898. The plans prepared for the War Department contemplate radical changes. At Steubenville it is proposed to remove the right channel pier, and rebuild the bridge so as to open the channel to the next pier on the right. At Bellaire, the West Virginia channel pier is to be removed, and the channel opened to the next pier on that side. At Troy street, Pittsburgh, the left channel pier is to be removed and the bridge rebuilt so as to give 344 ft. clear width at low water. At Tenth street similar changes are to be made.

Toronto, Ont.—At the last meeting of the York County Council it was decided to build a 30-ft. span bridge over the Mimico River at the Etobicoke.

Trail, B. C.—Mr. Heinzes and his associates will build bridges across the Columbia River at Trail and Robson. They are to be capable of accommodating railroad tracks, together with a roadway for vehicles and sidewalks for pedestrians.

RAILROAD LAW—NOTES OF DECISIONS.

Carriage of Goods and Injuries to Property.

In Illinois it is held that where a person contracts with a railroad company for a car in which to ship stock by a certain time, he will not be precluded from recovering damages for the failure to furnish the car because he did not tender to the company the freight charges in advance.

In Illinois the giving of notice of the arrival of goods may be waived by contract, and also by the previous course of dealings between the parties, or the uniform custom of the port.

In Louisiana a connecting carrier is not required to keep on hand, at the connecting point, cars of a special kind, for forwarding fruit, to meet a possible contingency arising from the defective condition of the car in which the fruit was originally shipped.

In Illinois a consignor of freight directed the carrier to forward a portion of it to places designated by a third party. Instead of doing this, the carrier delivered it to such third person, who wrongfully converted it, and disappeared. The carrier was held liable.

In Georgia the Supreme Court holds that where a shipper delivered to an express company a package wrapped in Manila paper and tied with a twine string, but not sealed, which contained the music and libretto in manuscript of an opera, valued at \$1,050, stating merely that it contained "music," without mentioning its value, and higgled over the 35 cents' charges asked, until he obtained a reduction of 10 cents, he could not, on the destruction of the property by the burning of the express car, recover its full value; it appearing that, had the company known the value of the package, it would have charged a much higher rate, and would have shipped the package in a safe as a "money package," in which event it would not have been destroyed.

In Texas a shipper, having put cattle for shipment in a stock pen provided by the carrier for the purpose, was fixing the gate thereof (which the carrier had negligently permitted to remain out of repair), to prevent escape of the cattle, when they, being frightened by a passing train, broke through the gate, which they could not have done but for its defective condition, injuring themselves and him. The Supreme Court rules that the negligence in permitting the gate to remain out of repair was the proximate cause of the injuries.

In Minnesota a carrier is not relieved from its duty to provide cars reasonably fit for the conveyance of the particular class of goods it intends to carry, by transporting the goods over its own line in the car of the connecting carrier in which it received them, since, if it uses the cars of the connecting carrier, it makes them its own for the purpose of conveying the goods.

The Supreme Court of Illinois holds that the Johnstown flood, caused by the breaking of a dam which retained a large volume of water at a high elevation, due to extraordinary and unprecedented rains, and thereby letting into a narrow valley a volume of water 20 to 30 ft. in height was an act of God.

The Supreme Court of Georgia lays it down that although the shipper by rail of live stock under a special written contract was by its terms bound, in case of accident or delay from any cause whatever, to feed, water and take proper care of the stock at his own expense, yet where such agreement further stipulated that the carrier's employees should provide the owner or person in charge of the stock all proper facilities on train and at stations for taking care of the same, if injuries to the stock resulted from want of food, water and attention, because of the carrier's failure to furnish such facilities at the proper time upon the arrival of the stock at destination, the carrier would be liable for such injuries.

Injuries to Passengers, Employees and Strangers.

In Illinois freight trains carrying passengers are not required, in the absence of usage, to receive and discharge passengers at the platform of the passenger depot before doing necessary switching.

In Illinois a railroad is not legally bound to remove ice from the railing or platform at the front end of an express car, or to make the platform safe for passengers.

In Illinois a walk across the tracks at a railroad station is an invitation to passengers incoming and outgoing, to whom its use is convenient, and it is negligence to run a fast train past another standing at the station, to which passengers are going, or which they are leaving.

In New York in an action for injuries to a passenger caused by stumbling over a mail bag lying on the station platform, between the waiting-room and the passenger car, several witnesses for the plaintiff testified that they had seen mail bags thrown on the platform many times during the preceding two years. Defendant's station agent testified that sometimes mail was thrown out of the mail car, but that he never knew it to be thrown at the place where plaintiff was injured. The conductor of the train, a trainman and the person who carried the mail between the post-office and the train testified that they never knew of mail bags being thrown off on that side of the station. The Supreme Court holds this sufficient to sustain a finding that defendant knew of the practice of throwing mail bags from the train on the platform.

In Alabama in an action against a railroad for personal injuries, the complaint averred generally that they were caused by defects in the condition of the ways, etc., and then, under a verdict, specified that the track at the time, and at or near the point of the derailment of the train on which plaintiff was a flagman, was defective, in that the cross-ties were rotten, the rails were insecurely fastened, and the track was not sufficiently ballasted, and the rails were old and worn. The Supreme Court rules that plaintiff need not prove all the specified infirmities in the track, but only sufficient of them to support the general averment of defects in the condition of the track; and, there being evidence that the cross-ties were rotten and the rails were insecurely fastened, the general charge for defendant, and a charge requiring plaintiff to prove all the specified infirmities, were properly refused, though there was no evidence that the track was not sufficiently ballasted, or that the rails were old and worn.

In Colorado the Supreme Court declares that a railroad should adopt a more definite rule for the guidance of its employees than one merely stating: "Blue is a signal to be used by car inspectors."

In Ohio the plaintiff was conductor of a freight train in jumping off his train while it was running at the rate of four or five miles an hour, in the night, at a station where he was required to register the time of passage of his train, he fell, by reason of a defective car stirrup, and a car wheel ran over his hand. It appeared that the rules of the company did not require him to get off the train while it was going, but authorized him to cause the engineer to stop the train. The Court rules that the evidence raised a presumption of negligence on his part, placing on him the burden to rebut such presumption.

In the same state as a brakeman was in the act of coupling cars, leaning over for the purpose of inserting the link in the drawbar in the usual manner, he discovered that the bar was broken, and, being fearful that he would receive an injury, the moment he had guided the link into the bar he dropped his hand, and in his excitement started back suddenly, catching his hand between the deadwoods of the two cars. The Court holds that the defective drawbar was the proximate cause of the brakeman's injury, since its discovery produced the excitement which made him less careful than he would otherwise have been.

The Supreme Court of Wisconsin holds that where it was an established custom on a railroad, between the engineers and firemen, that either, on going under the engine for any purpose, should notify the other, and a fireman went under his engine without notifying the

engineer, and without his knowledge, and, while there, was injured by reason of the opening of the blow-off cock by the engineer, the negligence was that of the fireman, and he cannot recover for the injury, though the act of the engineer was negligent; his own negligence being the proximate cause of his injury.

In Illinois a car repairer who goes under a car standing on the track, for the purpose of repairing it, without displaying signals as required by the rules of the company, relying upon another employee to protect him from moving engines, is negligent.

In Kansas a child about three years old was injured by a freight train which had been standing near the home of the child for some time prior to the injury, and brought an action against the railroad company to recover for the injury, alleging that proper precautions were not taken to prevent such injury. No one saw the injury inflicted, and the testimony did not show how the child came to be near the track, nor what its position was immediately prior to the injury. The Supreme Court holds that the evidence was insufficient to sustain a verdict for plaintiff.

In Missouri, while plaintiff was sauntering eastward along the sidewalk of a public street on which defendant's tracks were laid, looking through the open windows of a wire factory to watch the operation of the machines, a train backing in the same direction crossed the sidewalk on a spur track which led into the factory yard, and struck plaintiff in the back. The rails of the track, though sunken into the walk, could readily have been seen by plaintiff had he glanced down; and, had he looked in the direction from which the train came he could have seen it for a distance of several blocks. The Supreme Court rules that plaintiff was guilty of contributory negligence.

- ¹ C. C. & St. L. v. Perishaw, 61 Ill. App., 179.
- ² I. C. v. Carter, 62 Ill. App., 618.
- ³ Corso v. N. O. & N. E., 20 So. 753.
- ⁴ I. C. v. Carter, 62 Ill. App., 618.
- ⁵ So. Ex. v. Wood, 25 S. E. Rep., 436.
- ⁶ T. & P. v. Bigham, 36 S. W. Rep., 1,111.
- ⁷ Shea v. C. R. I. & P., 68 N. W. Rep., 608.
- ⁸ Wald v. P., C. C. & St. L., 44 N. E. Rep., 888.
- ⁹ Comer v. Stewart, 24 S. E. Rep., 845.
- ¹⁰ C. C. & St. L. v. Maxwell, 59 Ill. App., 673.
- ¹¹ O. & M. v. Allender, 59 Ill. App., 620.
- ¹² C. B. & Q. v. Czaja, 59 Ill. App., 21.
- ¹³ Ayres v. D. L. & W., 40 N. Y. S., 11.
- ¹⁴ A. G. S. v. Halley, 20 South 313.
- ¹⁵ C. B. & Q. v. McGraw, 45 Pac. Rep., 383.
- ¹⁶ P. & L. E. v. Blair, 11 Ohio Cir. Ct. Rep., 579.
- ¹⁷ C. H. & D. v. Bradshaw, 10 Ohio Cir. Ct. R., 645.
- ¹⁸ Crane v. C. M. & St. P., 67 N. W. Rep., 1132.
- ¹⁹ I. C. v. Winslow, 56 Ill. App., 462.
- ²⁰ U. P. v. Young, 45 Pac. Rep., 580.
- ²¹ Vogt v. M. P., 36 S. W. Rep., 646.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Chicago, Burlington & Quincy, quarterly, 1 per cent., payable March 15.
Delaware & Bound Brook, quarterly, 2 per cent. on guaranteed stock, payable Feb. 20.
Fort Wayne & Jackson, semi-annual, 2½ per cent. on preferred stock, payable March 1.

Stockholders' Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Gulf, Colorado & Santa Fe, annual, Galveston, Tex., March 3.
Missouri Pacific, annual, St. Louis, Mo., March 9.
Norfolk & Southern, annual, Norfolk, Va., March 4.
St. Louis, Iron Mountain & Southern, annual, St. Louis, Mo., March 9.
Tennessee Coal, Iron & Railroad Co., annual, Tracy City, Tenn., March 9.

Technical Meetings.

Meetings and conventions of railroad associations and technical societies will be held as follows:

The *Street Railway Accountants' Association* will meet to organize in Cleveland, O., March 23 and 24, 1897. For further particulars see issue of Feb. 12, page 121.
The *American Railway Association* will hold its convention at Richmond, Va., on April 7, 1897.
The *National Convention of Railroad Commissioners* will be held at St. Louis, Mo., on May 11, 1897.
The *International Association of Ticket Agents* will hold a convention at San Antonio, Tex., on March 10, 1897.

The *Association of American Railway Accounting Officers* will hold a convention at Richmond, Va., on May 26, 1897.

The *Association of Railway Claim Agents* will hold its convention at St. Louis, Mo., during the last week of May, 1897.

The *Master Car Builders' Association* will hold its annual convention at O'd Point Comfort, Va., beginning June 8, 1897.

The *American Railway Master Mechanics' Association* will hold its annual convention at Old Point Comfort, Va., beginning June 15, 1897.

The *National Association of Local Freight Agents' Associations* will hold a convention at Washington, D. C., on June 8, 1897.

The *Association of Railway Telegraph Superintendents* will hold a convention at Niagara Falls, N. Y., on June 16, 1897.

The *National Association of Car Service Managers* will hold a convention at Boston, Mass., on June 16, 1897.

The *Train Despatchers' Association of America* will hold a convention at Detroit, Mich., on June 23, 1897.

The *Railway Signalling Club* will meet on the second Tuesday of the months of January, March, May, September and November, in Chicago.

The *Western Railway Club* meets in Chicago on the third Tuesday of each month, at 2 p. m.

The *New York Railroad Club* meets at 12 West Thirty-first street, New York City, on the third Thursday in each month, at 8 p. m.

The *New England Railroad Club* meets at Wesleyan Hall, Bromfield street, Boston, Mass., on the second Tuesday of each month.

The *Central Railway Club* meets at the Hotel Iroquois, Buffalo, N. Y., on the second Friday of January, March, May, September and November, at 2 p. m.

The *Southern and Northwestern Railway Club* meets at the Kimball House, Atlanta, Ga., on the third Thursday in January, April, August and November.

The *North-West Railway Club* meets on the first Tuesday after the second Monday in each month, at 8 p. m., the place of meeting alternating between the West Hotel, Minneapolis, and the Ryan Hotel, St. Paul.

The *Northwestern Track and Bridge Association* meets at the St. Paul Union Station on the Friday following the second Wednesday of March, June, September and December, at 2.30 p. m.

The *American Society of Civil Engineers* meets at the House of the Society, 127 East Twenty-third street, New

York, on the first and third Wednesdays in each month, at 8 p. m.

The *Western Society of Engineers* meets in its rooms on the first Wednesday of each month, at 8 p. m., to hear reports, and for the reading and discussion of papers. The headquarters of the Society are at 1736-1739 Monadnock Block, Chicago.

The *Engineers' Club of Philadelphia* meets at the House of the Club, 1122 Girard street, Philadelphia, on the first and third Saturdays of each month, at 8 p. m., except during July and August.

The *Denver Society of Civil Engineers* meets at 3 Jacobson Block, Denver, Col., on the second Tuesday of each month except during July and August.

The *Montana Society of Civil Engineers* meets at Helena, Mont., on the third Saturday in each month, at 7:30 p. m.

The *Engineers' Club of Minneapolis* meets in the Public Library Building, Minneapolis, Minn., on the first Thursday in each month.

The *Canadian Society of Civil Engineers* meets at its rooms, 112 Mansfield street, Montreal, P. Q., every alternate Thursday, at 8 p. m.

The *Civil Engineers' Club of Cleveland* meets in the Case Library Building, Cleveland, O., on the second Tuesday in each month, at 8 p. m. Semi-monthly meetings are held on the fourth Tuesday of each month.

The *Engineers' Club of Cincinnati* meets at the room of the Literary Club, No. 25 East Eighth street, Cincinnati, O., on the third Thursday in each month, at 7:30 p. m. Address P. O. Box 393.

The *Engineers' and Architects' Club of Louisville* meets in the Norton Building, Fourth avenue and Jefferson street, on the second Thursday each month at 8 p. m.

The *Western Foundrymen's Association* meets in the Great Northern Hotel, Chicago, on the third Wednesday of each month. S. T. Johnston, Monadnock Block, Chicago, is secretary.

The *Engineers' Club of Columbus, (O.)* meets at 12½ North High street, on the first and third Saturdays from September to June.

The *Engineers' and Architects' Association of Southern California* meets each third Wednesday of the month in the Hall of the Chamber of Commerce, Los Angeles, Cal.

The *Engineers' Society of Western New York* holds regular meetings the first Monday in each month, except in the months of July and August, at the Buffalo Library Building.

The *Civil Engineers' Society of St. Paul* meets on the first Monday of each month, except June, July, August and September.

The *Engineers' Society of Western New York* meets on the first Monday of each month at the Society's rooms in the Buffalo Library.

The *Boston Society of Civil Engineers* meets at 715 Tremont Temple, Boston, on the third Wednesday in each month, at 7:30 p. m.

The *Engineers' Club of St. Louis* meets in the Missouri Historical Society Building, corner Sixteenth street and Lucas place, St. Louis, on the first and third Wednesdays in each month.

The *Engineering Association of the South* meets on the second Thursday in each month, at 8 p. m. The Association headquarters are at The Cumberland Publishing House, Nashville, Tenn.

The *Engineers' Society of Western Pennsylvania* meets at 410 Penn avenue, Pittsburgh, Pa., on the third Tuesday in each month, at 7:30 p. m.

The *Technical Society of the Pacific Coast* meets at its rooms in the Academy of Sciences Building, 819 Market street, San Francisco, Cal., on the first Friday in each month, at 8 p. m.

The *Association of Engineers of Virginia* holds its formal meetings on the third Wednesday of each month from September to May, inclusive, at 710 Terry Building Roanoke, at 5 p. m.

Western Society of Engineers.

The Western Society of Engineers held a meeting Thursday evening, Feb. 18, at Armour Institute, Chicago. Resolutions commemorating the death of David L. Barnes were read by the Secretary.

The paper presented by Mr. Ralph Modjeski, "Erection of the Draw Span of the New Rock Island Bridge," was illustrated by means of the stereopticon. The work of erecting the draw-span and the methods employed were fully covered by the paper, which was discussed by a number of members.

Chicago Electrical Association.

The winter and spring programme of the Chicago Electrical Association is as follows: March 5, "Electrical Resonance" by K. B. Miller, of the Western Telephone Construction Co.; March 19, "Cable Testing," by G. D. Hale, of the Western Electric Co.; April 2, "Requirements of High Speed and Heavy Electric Traction" by Hayward Cochrane and E. J. Swartout; April 16, "Arc Lighting in America and Europe," by C. Wiler, of the Western Electric Co.; May 7, "Direct Current Transformers," by C. H. Thordarson. The meetings are held at 8 o'clock in Room 1737, Monadnock Building.

The Railway Signal Club.

The *Railroad Gazette*, Nov. 27 last, contained an abstract of a paper presented before the Chicago Railway Signal Club, by Mr. A. H. Rudd, Signal Engineer of the New York, New Haven & Hartford, describing the new interlocking plant at Hartford, Conn. This paper was discussed at the last meeting of the club, Jan. 12, and an abstract of the discussion appears in another column of this issue.

At the January meeting, President Gillingham, referring to the request that a committee be appointed by the club to look into an experiment with certain makes of batteries for signal purposes, announced the appointment of a committee consisting of Messrs. Peck, Hobson and Hovey to experiment and report on primary batteries for signal purposes.

The following members were elected to serve as officers of the club during the year 1897: President, W. J. Gillingham; Vice-President, H. D. Miles; Secretary, E. M. Seitz.

Engineers' Club of St. Louis.

The 49th meeting was held at 1600 Lucas place, St. Louis, on the evening of Feb. 16. Mr. J. A. Ockerson reported that he had received a letter from the President of the Engineers' Club of Minneapolis stating that the Minneapolis Club had adopted a provision regarding the exchange of members among the engineering societies, similar to that in section 8 of the by-laws of the Engineers' Club of St. Louis. The paper of the evening by Mr. J. L. Van Ornum, entitled "Some Water Supplies of Southern California," was then read. The peculiar geographical and physical conditions of Southern California were briefly reviewed, and the methods of procuring water for irrigation and for the use of cities and towns were described. Although artesian wells and dams are often employed for the purpose of collecting water, the peculiarity of the region is the very extensive use of tunnels driven in the detritus, parallel to the course of the mountain streams. Numerous examples of the various methods were given.

Canadian Society of Civil Engineers.

The Canadian Society of Civil Engineers has arranged with the Faculty of Applied Science of the McGill University at Montreal to deliver a series of seven lectures on the transmission of power. They will be held in the rooms of the society each Thursday evening, from eight to nine o'clock. The first of the series was delivered at McGill University, Feb. 12. The programme of the remaining lectures is as follows: Three and four, "The Transmission of Power by Compressed Air," Professor Nicholson; five, "Thermal Storage and the Distribution of Power by Steam," Professor Durley; six, "The Transmission of Power by Gas," Professor Nicholson; seven and eight, "The Transmission of Power by Wire Ropes," Professor Durley.

The American Institute of Mining Engineers.

The twenty-seventh annual meeting of the American Institute of Mining Engineers was held in Chicago, on Feb. 16, 17, 18 and 19. The opening session was held at Kimball Hall and the other meetings at the Auditorium. About 150 members were in attendance. The following were a few of the papers presented: "The Geology of the Magnetites near Port Henry, N. Y.; and especially those of Mineville," by J. F. Kemp, New York City. "The Manganese Deposits of the Department of Panama, Republic of Colombia," by E. J. Chibas, New York City. "Biographical Notice of Joseph D. Weeks," by Alfred E. Hunt, Pittsburgh, Pa. "Current Theories of the Hardening of Steel," a discussion of Mr. Sauvener's paper on the microstructure of steel, etc., by F. Osmond, Paris, France. Discussion of Mr. Sauvener's paper on the microstructure of steel and the current theories of hardening, by Professor Ledebur and others. "The Handling of Material at the Blast-Furnace," by Axel Sahlin, Sparrow's Point, Md. The Caloric Value of Certain Coals as Determined by the Mahler Calorimeter," by N. W. Lord and F. Haas, Columbus, O. "The Chicago Drainage Canal," by J. F. Lewis, Chicago, Ill. "Influence of the Metalloids Sulphur, Phosphorus and Silicon in Cast-Iron," by Guy R. Johnson, Embreville, Tenn. "Direct Generation of Electricity from Carbon," by R. H. Sanders and H. M. Chance, Philadelphia, Pa. "Mining Methods in Northern Minnesota," by Prof. F. W. Denton, Minneapolis, Minn. "Preliminary Note on the Working of Edison's Briquettes in the Blast-Furnace," by Leonard Peckitt, Catasauqua, Pa. "Presidential Address," by E. G. Spilsbury, Trenton, N. J.

The officers elected for 1897 are as follows: President, Dr. Thos. M. Drown, South Bethlehem. Vice-Presidents (terms to expire 1899), D. W. Brunton, Aspen, Col.; W. E. Eustis, Boston, Mass.; Jas. Douglas, New York City, N. Y. Managers (terms to expire 1900), C. W. Goodale, Butte, Mont.; Frank Lyman, Brooklyn, N. Y.; Frank McM. Stanton, Houghton, Mich. Treasurer, Theodore E. Rand, Philadelphia, Pa. Secretary, Rossiter W. Raymond, New York City.

The local membership of the Institute, numbering 94 members, formed a General Committee, with Capt. R. W. Hunt as Chairman and Mr. J. F. Lewis as Secretary, for entertaining the visitors. On Wednesday evening, the 17th, a reception was given by the Technical Club, for which occasion the club-house was handsomely decorated. Thursday evening the annual banquet was held in the auditorium. Capt. R. W. Hunt acted as Toastmaster and the following toasts were responded to: "Our Retiring President," by Mr. E. G. Spilsbury; "The Ladies," by James F. Lewis; "Figures and Facts," by Mr. E. W. Parker; "Our Past Presidents," by Prof. R. H. Richards; "Great Guns," by Capt. W. H. Jaques; "Old Chicago," by Mr. Ossian Guthrie; "The Good Old Times," by Dr. R. W. Raymond.

On Thursday afternoon a visit was made to the Field Columbian Museum, the Illinois Central furnishing a special train, and on Friday the same company furnished a special train to Burnside, where two hours were spent in examining the railroad shops of the Illinois Central Railroad. Later the train took the party to the South Works of the Illinois Steel Co. at South Chicago. The Illinois Steel Company served a lunch in their main office building, after which three hours were devoted to inspecting the extensive plant. This includes eight blast furnaces, three Bessemer converters, a rail and billet mill, an open-hearth plant with nine furnaces ranging from 25 to 60 tons each, of the Wellman revolving type, a plate mill with 90 and 130-in. rolls, and all the necessary laboratories and shops for such works.

Traveling Engineers Association.

The subjects for discussion at the next annual meeting, to be held at Chicago commencing Sept. 14, 1897, are as follows:

- 1st. The Brown system of discipline, its operation and methods used.
Chairman, G. W. Gould, (M., St. P. & S. Ste. M.).
- 2d. The operation of lubricators under high steam-chest pressure, and other automatic appliances for oiling cylinders and valves.
Chairman, I. H. Brown (C. & O.).
- 3d. The care, maintenance and economical operating of metallic packing.
Chairman, J. A. Gibson (C., C. & St. L.).
- 4th. How should a locomotive be operated to secure the most economical use of steam and fuel, speed and weight of train to be considered?
Chairman, W. E. Widgeon (Vandalia).
- 5th. The injector, the difficulties met in its operation, and best remedies for the troubles.
Chairman, J. W. Hall (St. L. S.-W. of Texas).
- 6th. The preparation of coal for use on locomotives, and proper tools to be furnished.
Chairman, D. R. McBain (Mich. Central).
- 7th. Is the brick arch an economical adjunct to a locomotive?
Chairman, John Donovan (Central Vermont).
- 8th. The duties of engine and trainmen in testing air-brake equipment on engines and trains.
Chairman, D. C. Woods (C. R. I. & P.).
- 9th. Repairs and adjustment of air-brake equipment while on the road.
Chairman, T. A. Hedendahl (Union Pacific).
- 10th. Air-brake instructions by the traveling engineer while on the road.
Chairman, M. M. Meehan (D., S. S. & A.).

AUTOMATIC LUBRICATORS.

The Committee on the Operation of Lubricators Under High Steam-Chest Pressure and other Automatic Appliances for Oiling Cylinders and Valves, desires answers to the following questions:

1. In using sight-feed lubricators do you experience any trouble while working steam with wide-open throttle? 2. With a locomotive having large boiler, dome set well forward, large short dry pipe, large steam pipe, large passages and steam chests, under which conditions, with wide-open throttle, the boiler and steam-chest pressures are very nearly equal, do you have any trouble in lubricating valves and cylinders while working steam? If so, how do you overcome the trouble? 3. Have you tested the feeding of lubricator to steam chest? How, and with what results? 4. Have you tried

the Detroit or Nathan attachments for assisting the lubricator to work against high steam pressure? 5. Have you tried any other attachment? 6. Have you tried connecting the delivery end of oil pipe at other points than top of steam chest? 7. Have you connected steam pipe supplying lubricator to main steam dome? Is the dry steam of any advantage? 8. Have you tried changing the size of steam or oil pipes? Have you tried any additional piping to induce a steady circulation down through the oil pipes? 9. Should not lubricator be placed in such a position that there will be an incline in steam pipe from top of lubricator to boiler which will allow surplus water to drain to boiler in case water surging in boiler fills this pipe? 10. Do you find the balanced valve any harder to lubricate than the plain valve?

As considerable speculation is indulged in about the operation of sight feed lubricators in connection with high steam chest pressures, please give us any facts you may have at your disposal, reports of tests you have made and proposed remedies for any troubles you have located and advantages in these remedies. I. H. Brown, Chairman, 1621 Greenup street, Covington, Ky.

PERSONAL.

—Mr. I. S. Lauk has been appointed Auditor of the Wichita & Western, to succeed Mr. H. A. Dunn.

—Mr. F. A. Wheeler, who for 25 years has been Superintendent of the Baltimore & Ohio elevators at Baltimore has resigned.

—Mr. S. B. McIlvain, Superintendent of the National Foundry & Pipe Works, of Scottsdale, Pa., died suddenly of heart disease on Feb. 17.

—Mr. J. A. Somerville has been appointed General Agent of the Chicago, Burlington & Quincy, at Hannibal, Mo., to succeed Mr. George L. Forester, resigned.

—Mr. W. G. Taber, Master Mechanic of the Dunkirk, Allegheny Valley & Pittsburg, died suddenly at Dunkirk, N. Y., Feb. 18, of heart disease. Mr. Taber was 58 years of age.

—Mr. George P. Lyman, General Passenger Agent of the Chicago, Burlington & Northern, has been appointed General Freight Agent of that road, to succeed W. J. C. Kenyon, resigned.

—Mr. H. A. Willman, the new Mayor of Jermyn, Pa., was at one time connected with the Erie road and is well known among men on that and various other lines in the Lackawanna valley.

—The nominations by Governor Black, of Ashley W. Cole, George W. Dunn and Frank M. Baker to be Railroad Commissioners, have been confirmed by the Railroad Committee of the Senate.

—The announcement which appeared in these columns on Feb. 12 that Mr. A. M. Simmons, Manager of the Cleveland Car Service Association, would leave that position on April 1, is not true.

—Mr. Wellington Bertolet, Superintendent of the Reading Division of the Philadelphia & Reading, has resigned. Mr. Bertolet will engage in the coal business with his brother, in Girardville, Pa.

—Mr. George J. Hartman, formerly Superintendent of the Southern Division of the Atchison, Topeka & Santa Fe, has been appointed Superintendent of the Mexican Central, with headquarters in the City of Mexico.

—Mr. S. F. Parrott, late General Manager of the Columbus Southern, has been elected Vice-President and General Manager of the Gulf City Construction Co., which is building the Mobile, Jackson & Kansas City.

—Mr. Frank R. Greene, Secretary of the Chicago City Railway Co., has been elected Vice-President and General Manager of the Chicago General Railway Co., and will take charge of the operating department of that road.

—Mr. Edward Peck, formerly Chief Train Dispatcher of the Cincinnati Division of the Cleveland, Cincinnati, Chicago & St. Louis, has been appointed Trainmaster of the Baltimore & Ohio, with headquarters at Grafton, W. Va.

—Mr. D. F. Jack, Third Vice-President of the Plant system has been placed in charge of freight traffic, with headquarters at Savannah, Ga., and will report to the First Vice-President. Mr. Jack's title has not been changed.

—Mr. L. W. Renn, Trainmaster of the First Division of the Seaboard Air Line, has resigned and will be succeeded by J. M. Turner, who will have charge of both the first and second divisions of the road, with office in Raleigh, N. C.

—Mr. O. R. Wood has been appointed Traveling Passenger Agent for the Cleveland, Lorain & Wheeling, with headquarters at Wheeling, W. Va. Mr. Wood was formerly Traveling Passenger Agent of the Wheeling & Lake Erie.

—Mr. Anthony S. Morrow, who was one of the projectors of the Cresson & Clearfield County & New York Short Route Railroad, and President from its organization to its absorption by the Pennsylvania, Jan. 1, 1893, died at his home in Hollidaysburg, Pa., Feb. 17.

—Mr. William R. Taylor has been elected Vice-President of the Philadelphia & Reading Railroad and of the Reading Coal & Iron Co. Mr. W. G. Brown has been elected Secretary of the Philadelphia & Reading Railroad and Assistant Secretary of the Reading Coal & Iron Co., to succeed Mr. Taylor.

—Mr. Jesse Burdett, General Superintendent of the Rutland Railroad, died on Feb. 23, at Rutland, Vt. Mr. Burdett became General Superintendent of the Rutland when it was organized as a division of the Vermont Central, and continued in that position after the management of the road became independent.

—Mr. Jeffrey Denis died at his home in Chester, Pa., on Feb. 15. Mr. Denis was one of the organizers of the Union Electric Street Railway Co. of Chester, and was at one time Secretary of the Chester & Media Electric Railway Co. He was also Vice-President of the Johnston Railroad Frog & Switch Co., of Chester.

—Mr. J. F. Le Baron has been employed as Consulting Engineer by the United States Coast and Geodetic Survey to examine and check the charts of the St. Johns River and the east coast of Florida, and to add to them the soundings and surveys of numerous bays and creeks that were omitted in the original survey. He will also add to the charts the new railroads, canals, towns, wharves, buildings, etc., that have been built since the original surveys were made, and the local names of all places on the chart, as far as known, bringing them up to date.

—Mr. Michael Trump, Assistant Superintendent of the Pittsburgh Division of the Pennsylvania, has been appointed General Superintendent of Transportation, to succeed Mr. J. B. Hutchinson, promoted to be General Manager. Mr. Trump is 43 years old. He graduated from the Polytechnic College of Pennsylvania as a civil engineer in 1874, and was engaged in various railroad surveys and other similar work until 1877, when he was appointed Assistant Resident Engineer of the Central Pacific in charge of the Sacramento and Truckee divisions. His service with the Pennsylvania began in 1880, and he was Assistant Engineer and Supervisor on various divisions for the next three years, having been appointed to the position which he now vacates in 1883. The Assistant Superintendency at Pittsburgh ranks virtually the same as a Superintendency, as Mr. Pitcairn, the Superintendent, is also General Agent for the Pennsylvania Railroad as a whole, and the duties of this latter office absorb the greater share of his time.

—Mr. Richard L. O'Donnell, who has been appointed Assistant Superintendent of the Pittsburgh Division of the Pennsylvania Railroad, has been Assistant Engineer on that division for the last two years. Mr. O'Donnell is 36 years old, and was graduated from the Polytechnic College of Pennsylvania in 1882. He has been on the Pennsylvania road since 1883, having been Assistant Engineer and Supervisor on several different divisions.

—Mr. J. M. Barr, who resigned the position of General Superintendent of the Great Northern, as noted in our last issue, has been appointed Vice-President of the Norfolk & Western, with headquarters at Roanoke, Va. This is a new position on the N. & W. Previous to the reorganization there were two Vice-Presidents, J. H. Sands being Vice-President and General Manager, in charge of the Operating Department, and W. C. Bullitt, Vice-President, in charge of the Traffic Department of the road. Mr. Barr became connected with the Great Northern Sept. 1, 1894, as Superintendent of the Breckenridge Division, and in January, 1895, was appointed General Superintendent of the Eastern Division. On July 20 of the following year he was made General Superintendent of the entire system. Mr. Barr was previously Superintendent of the Chicago, Burlington & Northern, and Division Superintendent of the Union Pacific, and later Superintendent of the Chicago & Evanston and Chicago & Council Bluffs divisions of the Chicago, Milwaukee & St. Paul. Through a similarity of names, Mr. J. M. Barr has been confused in the minds of some persons with that of Jacob N. Barr, Superintendent of Motive Power of the Chicago, Milwaukee & St. Paul.

ELECTIONS AND APPOINTMENTS.

Chicago & Northwestern.—Effective Feb. 14 the lines known as the Middle Iowa Division were attached to and made a part of the East Iowa Division, and the office of Superintendent of the Middle Iowa Division was abolished. M. S. Rizer, Assistant Superintendent, with headquarters at Clinton, Ia., will have charge of the entire East Iowa Division. E. E. Smith has been appointed Trainmaster and J. A. Sellers Chief Train Dispatcher of the East Iowa Division, with headquarters at Belle Plaine, Ia.

Chicago, Burlington & Northern.—George P. Lyman has been appointed General Freight Agent to succeed W. J. C. Kenyon, resigned. The appointment took effect Feb. 15.

Cleveland, Cincinnati, Chicago & St. Louis.—Frank Finley has been appointed Live Stock Agent. F. Garstang has been appointed Contracting Agent to succeed Mr. Finley.

Delaware, Lackawanna & Western.—At the annual meeting of stockholders on Feb. 23, the present Board of Directors was re-elected with the exception of Alexander T. Van Nest, deceased, who is succeeded by R. G. Rolston.

Fort Worth & Denver City.—E. A. Hirshfield, formerly Traveling Passenger Agent, with headquarters at Fort Worth, Tex., has been appointed Assistant General Passenger Agent.

Kanawha & Coal River.—This company, at the recent annual meeting at Charleston, W. Va., elected the following directors: J. W. Humbird and Robert McDonald, Cumberland, Md.; W. N. Talley, Spring Hill, W. Va.; J. B. G. Roberts and W. A. Johnson, Cumberland, Md. The directors organized by electing J. W. Humbird, President; Robert McDonald, Secretary and Treasurer, and W. N. Talley, Auditor.

Lehigh & Wilkes Barre.—At a meeting of the stockholders held recently in Philadelphia the following directors were elected: J. Rogers Maxwell, President, George F. Baker, J. A. Garland, Joseph L. Harris, Samuel Dickson, C. Pardee and Andrew H. McClintock who succeeded Charles Parrish.

Long Island.—Frank E. Haff has been appointed Assistant Treasurer, with office at Long Island City. The position of Superintendent of Stations and General Car Agent and that of Auditor of Revenue have been abolished. The changes took effect Feb. 15.

Mexican Central.—George J. Hartman has been appointed Superintendent, with headquarters in the City of Mexico.

Missouri Pacific.—Charles Hoeppen, Live Stock Agent of the company at Little Rock, Ark., has been appointed Assistant Claim Agent to succeed W. T. Walker, deceased, with headquarters at Sedalia, Mo.

Mobile, Jackson & Kansas City.—At the recent annual meeting of the Gulf City Construction Co., which is building this road, the following officers were elected: President, F. M. Stratton; Vice-President and General Manager, S. F. Parrott; Secretary and Treasurer, H. H. Lane.

Northern Central.—At a meeting of the directors held on Feb. 17, the following officers were elected: President, Frank Thomson; First Vice President, John P. Green; Second Vice President, Charles E. Pugh; Third Vice President, S. M. Prevost; General Manager, J. B. Hutchinson; General Superintendent of Transportation, Michael Trump; Freight Traffic Manager, William H. Joyce; Assistants to President, Samuel Rea, William A. Patton and E. T. Postlethwaite.

Pennsylvania.—Michael Trump has been appointed General Superintendent of Transportation, with office at Philadelphia, to succeed J. B. Hutchinson, now General Manager. R. L. O'Donnell, formerly Assistant Engineer of the Pittsburgh Division, has been appointed Assistant Superintendent of that division, headquarters

at Pittsburgh, to succeed Mr. Trump. Joseph B. Baker has been appointed Assistant Engineer of the Pittsburgh Division. The above appointments went into effect Feb. 17.

Philadelphia & Erie.—At a meeting of the new Board of Directors on Feb. 19, N. Parker Shortridge was re-elected President and J. S. Vansant Secretary & Treasurer of the company.

Philadelphia & Reading.—William R. Taylor has been elected Vice-President of the company. W. G. Brown, formerly Assistant Secretary, has been elected Secretary to succeed Mr. Taylor.

Philadelphia & Trenton.—At the annual meeting of stockholders, held in Philadelphia on Feb. 17, the following directors were elected: G. M. Dorrance, Alexander Biddle, N. P. Shortridge, Alexander Fox, W. H. Wilson, Frank Thomson, Amos R. Little, John P. Green, George Woods, Samuel Rea, W. H. Barnes and Lewis Elkin.

Seaboard Air Line.—The Trainmaster's office at Portsmouth, Va., has been abolished, the First and Second Divisions of the road being consolidated under the charge of one trainmaster, with office in Raleigh, N. C. J. M. Turner has been appointed Trainmaster of the consolidated divisions.

Southwest Texas.—At a meeting of the Directors held recently at Austin, Tex., the following officers were elected: President, James Kerr; Vice-President, William Muir; General Manager, George M. Edgerton; Secretary, L. J. Warham; Treasurer, D. Rodger, Chief Engineer, J. S. Peter; General Attorneys for Texas, B. S. Rodgers and D. McN. Turner.

RAILROAD CONSTRUCTION, Incorporations, Surveys, Etc.

Georgia & Florida.—This is the name of a road being built by G. S. Baxter & Co., of 18 Wall street, New York City. The road, which is standard gage, will extend from Haylow, Echols County, Ga., a point on the Plant system about 10 miles south of Du Pont, Clinch Co., through those counties to the western side of Okfenokee swamp, to a point on the west side of the Suwanee River about four miles below Mixon's Ferry, a distance of about 12 miles. Seven miles have been completed and the balance is ready for the rails, which have just been shipped by the Carnegie Steel Co. At present the road will be used for logging purposes by the builders, but it may ultimately be extended south, to a connection of one of two roads now being built.

Mexican National.—A branch line is proposed from the present terminus at Patzcuaro, southwest 50 miles to Ornan on the Pacific coast. Preliminary surveys have been made and it is expected that construction work will begin about March 1. The new line will pass through an extremely mountainous country and will be difficult to build. It will give an outlet for a rich coffee, rice and sugar district, and is also expected to develop copper and gold mines in the Ornan district.

Minneapolis, St. Paul & Ashland.—Tracklaying been completed on this road from Ashland, 25 miles southwest to a point on the Duluth, South Shore & Atlantic. The road is proposed to connect Ashland with St. Paul and Minneapolis, and when completed will be about 180 miles long. It is expected to open up valuable hard wood and pine forests in Northwest Wisconsin. Surveys have been completed through to St. Croix Falls, Wis.

Mobile, Jackson & Kansas City.—Work is being pushed rapidly on this line, which is to connect Mobile, Ala., with Jackson, Miss., about 180 miles distant. All surveys have been made. Tracklaying has been completed from Mobile northwest to Spring Hill, nine miles, and grading to a point 19 miles further. The company's general camp is located about 12 miles from Mobile.

Olean, Rock City & Bradford.—This company was granted a charter in Pennsylvania, on Feb. 18. The incorporators are H. L. Pierce and Charles E. Hudson, of Leominster, Mass.; George Fobes, Olean, N. Y.; E. B. Sage, Derrick City, Pa.; J. C. Fox, W. E. Mathews and C. L. Rogers, of Bradford, Pa. The capital stock is \$100,000. The company proposes to build a road from the village called State Line, at a point on the state line of New York and Pennsylvania, southwesterly through Rock City, Gilmore and Derrick City to the city of Bradford, all in McKean County, Pa., a distance of about 10 miles.

Peoria & St. Louis.—The contract for building this road from Pekin, Ill., south to Springfield, Ill., 55 miles, has been given to D. L. Wing, of Springfield. A considerable amount of grading is now being done and track-laying has been begun. It is expected that the entire line will be completed by Aug. 1. The road is being laid with 65-lb. rails. The directors of the company are: Louis H. Thomas, of Thomasville, Ill.; William B. Corneau, T. W. S. Kidd, Thomas C. Mather and Turney English, all of Springfield. Louis H. Thomas, is President, and William B. Corneau, Secretary.

Pittsburgh, Monongahela & Wheeling.—A meeting was held in Pittsburgh last week at which it was decided to begin work at once on this road. The contract for grading was given in May, 1896, to Joseph Giannini, but for some unexplained reason no work was done. The proposed line is to extend from Monongahela, Pa., southwest 50 miles to Wheeling, W. Va., via Bentleyville. A party of engineers is now making a final survey for the line. The road is expected to open up coal fields between Monongahela and Wheeling. W. G. Dacey, 40 Wall Street, New York City, is President of the company.

San Francisco & San Joaquin Valley.—Construction work is about to begin on the extension of this road from Fresno, Cal., south to Bakersfield in Kern County. The contract for grading the road from Fresno south to Hanford, 30 miles, has been let to Grant Bros., of San Francisco. This contract is expected to be filled in four months. Surveys for the entire line to Bakersfield were completed some time ago, but delays were caused by trouble in obtaining right of way.

Silver Springs & Western.—This road, which extends from Ocala, Marion County, Fla., east seven miles to Silver Springs, has recently been completed and is now in operation. The road connects at Ocala with the Plant System and at Silver Springs with the boats on the Ocklawaha River.

Southern Pacific.—J. T. Mabl, Chief Engineer of the company, states that a newly-located line, about 1½

miles long, will be built in Western Texas, at a point about 5 miles east of Lozier, for the purpose of eliminating considerable timber trestling existing in the present line at that place. The new track, when completed, will connect at both ends with the present line.

Susquehanna Connecting.—The contract for building the first portion of this proposed line from Paddy's Land, a point 11 miles east of Wilkes-Barre, Pa., north 10 miles to Minooka, has been given to John Shiel's, of Flemington, N. J., and it is expected that operations will be begun shortly. The company was organized some months ago to build a road from Paddy's Land, northeast, 22 miles to a connection with the Wilkes-Barre & Eastern, at Winton, Lackawanna County. The New York, Susquehanna & Western is said to be interested in the project.

Electric Railroad Construction.

Belle Vernon, Pa.—A charter was granted at Harrisburg, Feb. 18, to the Charleroi, Belle Vernon & Fayette City Street Railway Co., to construct a 3-mile line from North Charleroi through Charleroi, Speers and across the Monongahela River bridge, at Belle Vernon. The capital stock is \$20,000. Among the directors are: W. M. Bell, of Pittsburgh, President; W. M. Jones and C. P. Anderson.

Concord, N. H.—Bills to incorporate the following electric roads are before the Legislature of New Hampshire: The Manchester, Chester & Haverhill Street Railway Co., the Nashua, Salem & Haverhill Street Railway Co., Nashua, Manchester & Concord Electric Railroad Co. and the Merrimac Valley & St. Lawrence Street Railway. These bills cover the plan to establish a continuous line of electrical roads from the Massachusetts boundary on the south to the Canadian line on the north.

Dayton, O.—Stern & Silverman, of 707 Arch street, Philadelphia, write to us as follows in regard to the proposed electric road: "The contract for the complete construction and equipping the new road of the Cincinnati & Miami Valley Traction Co. from Dayton to Hamilton was awarded to us, we receiving the contract for the complete construction of the grading, track work, overhead construction, erection of two brick and steel power stations, one brick and steel car-barn, furnishing the necessary power machinery for the power stations, consisting of boilers, engines, dynamos, condensing plant; also all of the necessary passenger coaches, freight, mail and express coaches, necessary electric motors for the propelling of cars, and the apparatus for the overhead construction."

Delavan, Wis.—A 25-year franchise has been granted to the Delavan Light & Fuel Co. to build an electric street railroad to accommodate the travel between Delavan and Delavan Lake during the resort season.

Jacksonville, Fla.—The Benjamin Park Railway Co. has been granted a charter to build a line two miles long from Jacksonville to one of the suburbs.

Hamilton, Ont.—A St. Catharines syndicate, with Dr. Olle at its head, proposes to build an electric road west from St. Catharines, to connect with the Hamilton, Grimsby & Beamsville Electric Railway at Beamsville. The Hamilton, Chedoke & Ancaster Electric Railway Co. have asked for a bonus of \$18,000 from the city. The road is to be extended from Ancaster to the mountain, a distance of 10 miles.

Louisville, Ky.—The Metropolitan Railway Co. has been organized with power to build 150 miles of electric road in Louisville and vicinity. It will endeavor to obtain the right of way on some of the streets now held by the Louisville Street Railway Co., and agrees to make a reduction in the fare to three cents, providing the proper rights are given to the company. Among those interested are T. F. Hargis, Louisville; George H. Haines, Washington; Robert M. Kilgore and others of Louisville. The capital stock is \$4,000,000.

New York, N. Y.—The Metropolitan Street Railway Co., through some of its associated lines, has applied to the Board of Aldermen for the right to make several connections and extensions. A public hearing will be given March 12.

Orange, N. J.—In consideration of obtaining a franchise to run an electric road on Central avenue, in Orange, by the Consolidated Traction Co., the tracks are to be laid in the middle of the street, and the company is to macadamize the roadbed from curb to curb. The company is to bear part of the expense of repairing the avenue and clearing away the snow in proportion to the part of the street their tracks occupy. All cars used on the line are to be new and heated with electricity and at least one car is to run through to Jersey City every half hour of the day and night. The fare to New York is to be 25 cents for the round trip, and not more than 5 cents from any part of the Oranges to Newark, with transfer privileges to any point within the district.

Oshkosh, Wis.—A franchise has been granted to F. H. Josslyn to build a line on River street, in Oshkosh. It will be built at once, and operated by the Citizens' Traction Co. in connection with its electric road which is now under construction. This will be used simply as a switch track for taking coal and other freight from the steam road to the plant of the Citizen's Traction Co.

Parkersburg, W. Va.—Dr. J. E. Lowes, of Dayton, O., and Col. H. D. Knox, of Marietta, O., have applied to the County Commissioners of Wood County, W. Va., for the privilege of using certain public highways in that county for building an electric railroad belt line from Parkersburg to Williamstown, and Waverly, all in West Virginia, and return through those cities by a different route. The Commissioners are considering the proposition. F. J. Cutter, of Marietta, the representative, agreed that if the right of way is granted, work shall begin in 30 days and be completed within the present year. This is a part of the plan for connecting Parkersburg, W. Va., and Marietta, O., a distance of 14 miles.

Pittsburgh, Pa.—The Homestead & Highlands Street Railway Co. is preparing to complete its connections between McKeesport, Braddock and Pittsburgh, the object being to secure a through line from those towns to the heart of Pittsburgh.

The stockholders of the Mt. Troy & Reserve Township Traction Co. have reorganized by electing the following officers and directors: C. Beckert, Jr., President; William Eberhart, Vice-President; August Beckert, Secretary and Treasurer; George Beckert, John P. Ober, William M. Smith and others. An executive committee, composed of August Beckert, Charles Beckert and Henry Scarborough, was appointed to obtain estimates on the grading and cost of equipment for the

proposed two-mile line. The capital stock of the road is now \$50,000.

Charters have been granted to the Baden Electric Railway Company and to the Economy Electric Railway Co., each with \$50,000 capital stock. The directors are: Richard R. Quay, of Sewickley, President; Jno. C. Oliver, Allegheny; Edward G. Applegate, Braddock; Henry D. Atwood and James F. Burke, Pittsburgh. The first-named line will extend from Allegheny to Baden, Beaver County, and the last-named from Baden to Economy.

The West End Traction Co. is preparing to build the Sheridan and Elliott extension of the road. The heavy grading commenced last fall is about completed, and it is the intention to have the line in operation by April 1.

Titusville, Pa.—Council has amended the Titusville electric railway ordinance, changing the route somewhat and giving the company an exclusive franchise so long as it shall give reasonable service.

Washington, D. C.—Contract was awarded on Feb. 17 to the White-Crosby Co., of Baltimore, for the overhead and pole work on the District of Columbia division of the Columbia & Maryland Railroad. The contract includes two and one-half miles of construction on which the track work is finished. The contract is to be finished by March 2 and work began last week.

The Metropolitan Railway Company has obtained proper permission to extend its conduit electric road along the Columbia road and other thoroughfares to a point on Eighteenth street.

Watertown, Mass.—The Watertown Selectmen have granted a franchise to the Newton Street Railway Co. to lay tracks and operate cars by electricity on Pleasant and Bridge streets. This line will run from Waltham, through Bemis and North Newton, to Newton Corner, and will be about four miles long.

Wilmington, Del.—A bill incorporating the Claymont & Wilmington Electric Railroad Co. is to be introduced into the Delaware Assembly in a few days. Among the incorporators are: J. N. Carswell and I. S. Elliott. The company proposes to build a line over the proposed route of the Chester & Wilmington road.

GENERAL RAILROAD NEWS.

Baltimore & Ohio.—Earnings for December and for the six months ended Dec. 31 were:

December:	1896.	1895.	Inc. or Dec.
Gross earn.....	\$2,177,804	\$2,161,040	I. \$16,764
Oper. expen.....	1,627,419	1,143,546	I. 183,883
Net earn.....	\$550,385	\$917,494	D. \$367,109
July 1 to Dec. 31:			
Gross earn.....	\$13,513,349	\$12,733,016	I. \$780,333
Oper. expen.....	10,128,537	8,628,131	I. 1,500,406
Net earn.....	\$3,384,812	\$4,104,885	D. \$720,073

Chesapeake, Ohio & Southwestern.—On Feb. 20, Judge Lorton, of the United States Circuit Court in Louisville, Ky., gave judgment for \$990,914.46 against the Receiver, in favor of the United States Trust Co., of New York. The entire equipment of the road has been ordered sold to satisfy this judgment, the allowable time being 10 days. The road extends from Louisville, Ky., to Memphis, Tenn., 390.6 miles, and is now operated by the Illinois Central. It is expected that the latter road, which now holds nearly all of the first mortgage bonds, will be the purchaser.

Chicago & Eastern Illinois.—The purchase of the Chicago, Paducah & Memphis was ratified at a special meeting of stockholders held in Chicago, on Feb. 17. This company secured control of that road last summer. It extends from Alton, south to Marion in Southern Illinois, 97 miles.

Columbus, Sandusky & Hocking.—A committee composed of Louis Fitzgerald, Thomas Hillhouse, L. C. Weir, F. K. Sturgis and John G. Deshler, has been appointed, at the request of the holders of a large amount of first and of general mortgage bonds, to protect the interests of the bondholders and to reorganize the company's affairs. The committee is expected to secure from a competent expert a report upon the property and its earning capacity and will then formulate and submit a plan of reorganization. The company has been unable to dispose of the first mortgage or prior lien bonds and to secure thereby funds to discharge the Receiver's certificates and other preferential liens. The receivership lasted but one week, the property being restored to the directors Jan. 26.

Grand Trunk.—The returns of the company for the six months ended Dec. 31, 1896, show a surplus of \$39,000, as against a deficit for the same period of 1895 of \$33,150, giving an increase in net earnings of \$72,150, or about \$900,000. The net revenue deficiency for the year 1896 was \$43,062, as against \$127,233 in 1895, a net gain of \$84,171. The gross receipts for the year were \$2,079,700; the net receipts, \$616,100. The Chicago & Grand Trunk shows a deficiency of \$67,500, and the Detroit, Grand Haven & Milwaukee a deficiency of \$24,900. A number of improvements are contemplated, including the enlarging of the Victoria Bridge at Montreal to admit the building of a second track.

Hartford & Connecticut Western.—At a recent meeting of the directors it was decided to petition the Connecticut Legislature for authority to issue a general mortgage of \$1,500,000, of which \$700,000 shall be used to retire bonds outstanding, and the balance for the construction of the branch from Tariffville, northeast 17 miles, to West Springfield, Mass. The road is leased by the Philadelphia, Reading & New England.

Montreal & Western.—A special general meeting of the shareholders will be held in Montreal on March 1, for the purpose of considering and authorizing a new issue of bonds and the execution of a mortgage to secure the payment of the principal and interest thereof, for the purpose of paying off the indebtedness of the company, including all bonds now outstanding. The road is leased to the Canadian Pacific.

Natchez, Red River & Texas.—This road, which extends from Vidalia, Miss., to Black River, La., 25 miles, was sold at Vidalia on Feb. 13 and was bought in by the Hale estate, the original owners. It is the belief of those closely identified with the road that it will be improved and extended. The road has been before the United States Circuit Court of Louisiana for about 2½ years.

Northern Pacific & Manitoba.—The suit of the company against Henry Villard in the United States Circuit Court for an accounting as to the disposition of between \$4,000,000 and \$5,000,000 worth of bonds has been discontinued.

New England.—Earnings for the three months ending Dec. 31 and for six months from July 1 to Dec. 31 were:

Three months:	1896.	1895.	Inc. or Dec.
Gross earn.....	\$1,381,600	\$1,650,558	D. \$268,958
Oper. expen.....	1,054,677	1,142,916	D. 88,239
Net earn.....	\$326,923	\$507,642	D. \$180,719
Six months:			
Gross earn.....	\$2,744,735	\$3,299,257	D. \$554,522
Oper. expen.....	2,161,478	2,256,306	D. 94,828
Net earn.....	\$583,257	\$1,042,957	D. \$459,700

New York, Chicago & St. Louis.—Earnings for the quarter ending Dec. 31 were:

	1896.	1895.	Inc. or Dec.
Gross earn.....	\$1,476,246	\$1,820,985	D. \$344,739
Oper. expen.....	1,037,427	1,318,874	D. 44,585
Net earn.....	\$438,819	\$502,111	D. \$63,292

New York, New Haven & Hartford.—The company has sold to Messrs. Kidder, Peabody & Co., R. L. Day & Co., and Estabrook & Co., a sufficient amount of its treasury securities to fund its floating indebtedness and to provide for refunding the obligations of its branch lines which mature during the coming year. The amount involved in the transaction is understood to be nearly \$14,000,000. The floating debt of the company is approximately \$9,000,000, or about the amount which it paid for control of the New England road. To liquidate this the company has sold \$5,000,000 of the 5 per cent. consolidated mortgage bonds of the New England road which were bought by the company during the New England reorganization. The remaining \$3,000,000 for funding the debt is provided for by the sale of non-convertible debenture 4 per cent. bonds. The remaining \$5,000,000 involved in the transaction is for the funding of branch line obligations.

Roaring Creek & Charleston.—In the United States Circuit Court at Parkersburg, W. Va., Judge Jackson has issued an order, calling upon C. L. Dixon, Receiver, to show cause why he should not be removed, and to explain why he failed to issue \$150,000 Receiver's certificates to complete the road, as directed by the Court in June, 1895. Mr. Dixon was appointed Receiver in February, 1895. Henry C. Terry, President of the company, and who owns 51 per cent. of the capital stock, has applied for an injunction restraining the issue of the above-mentioned bonds. The road is capitalized at \$300,000, and its present bonded indebtedness is \$150,000. The other shareholders are adverse to the injunction, and claim that the completion of the road has been unnecessarily delayed.

Southern.—Earnings for January and for seven months ending Jan. 31 were as follows:

January:	1897.	1896.	Inc. or Dec.
Gross earn.....	\$1,565,063	\$1,644,070	D. \$78,107
Oper. expen.....	1,086,170	1,192,512	D. 106,342
Net earn.....	\$478,793	\$451,558	I. \$27,235
P. c. expen. to earn....	69.3	72.5	
July 1 to Jan. 31:			
Gross earn.....	\$11,404,543	\$12,062,232	D. \$657,689
Oper. expen.....	7,625,401	8,079,179	D. 453,778
Net earn.....	\$3,779,147	\$3,983,053	D. 203
P. c. expen. to earn....	66.8	66.9	

Southern Pacific.—On Feb. 22 the House of Representatives passed the paragraph in the General Deficiency bill, which provided for a payment of a balance on account of judgment by the Court of Claims in favor of this company. An appropriation to pay a part of the judgment was made by the last Congress, but the payment of the balance, amounting to \$1,310,427, has, until now, been resisted in the House.

Union Pacific.—Earnings of the entire system for December and for the year ended Dec. 31 were:

December:	1896.	1895.	Inc. or Dec.
Gross earn.....	\$1,977,027	\$1,861,795	I. \$115,232
Oper. expen.....	1,323,567	1,189,927	I. 133,640
Net earn.....	\$653,460	\$671,868	D. \$18,408
Year:			
Gross earn.....	\$22,939,670	\$22,273,548	I. \$666,121
Oper. expen.....	14,630,206	13,642,053	I. 988,153
Net earn.....	\$8,309,463	\$8,631,495	D. \$322,031

UNION PACIFIC PROPER.

December:	1896.	1895.	Inc. or Dec.
Gross earn.....	\$1,175,593	\$1,142,431	I. \$33,161
Oper. expen.....	823,953	774,673	I. 49,279
Net earn.....	\$351,639	\$367,757	D. \$16,117
Year:			
Gross earn.....	\$14,382,291	\$14,336,291	I. \$46,000
Oper. expen.....	9,074,850	8,837,321	I. 237,528
Net earn.....	\$5,307,440	\$5,498,969	D. \$191,528

OREGON SHORT LINE & UTAH NORTHERN.

December:	1896.	1895.	Inc. or Dec.
Gross earn.....	\$473,591	\$471,077	I. \$2,513
Oper. expen.....	290,042	232,696	I. 57,345
Net earn.....	\$183,548	\$238,380	D. \$54,832
Year:			
Gross earn.....	\$5,578,873	\$5,394,197	I. \$184,675
Oper. expen.....	3,159,373	2,973,558	I. 185,815
Net earn.....	\$2,419,500	\$2,420,639	D. \$113

Wheeling & Lake Erie.—Charles Fairchild and Alexander McNeill, the investigating committee representing the holders of over \$1,000,000 par value of stock, find a floating debt of \$1,104,482, of which \$523,098 is bills payable. The balance sheet of Nov. 30, 1896, as furnished by the Receivers, shows total liabilities of \$24,482,734. The committee reports that the cost of the road and equipment increased \$14,203,202 in 10 years from July 1, 1886, to July 1, 1896. The issue of \$5,000,000 common stock listed in September, 1896, did not appear upon the books as late as Nov. 30, 1896. The company's books at Toledo show that the sum representing road and equipment is made up chiefly of the face amounts of stocks and bonds issued directly to various construction companies upon accounts for construction and equipment. The Wheeling extension was built by the Public Works Construction Co., which received \$3,500,000 of common stock and \$1,500,000 of Wheeling extension bonds. The Steubenville & Bellaire extensions were built by the Industrial Construction Co.

Electric Railroad News.

Boston, Mass.—The stockholders of the Braintree & Weymouth Street Railway Co. have voted to bond the road for \$100,000. The capital stock of the company is \$160,000, of which \$124,800 has been issued.

Buffalo, N. Y.—Press reports state that the Niagara Falls & Lewiston Electric Railroad has been mortgaged to the Knickerbocker Trust Co., of New York, for \$1,000,000, the money to be spent in wiping out the present indebtedness and making improvements.

Homestead, Pa.—The Homestead & Highlands Street Railway Co. has filed a notice in the State Department at Harrisburg of an increase of its capital stock from \$200,000 to \$400,000. The Braddock & Homestead Street Railway Co. has made an increase from \$7,500 to \$25,000.

Milwaukee, Wis.—Vice-President Henry C. Payne, of the Milwaukee Electric Railway & Light Co., states that there will be no extensions during the present year, as the company has not obtained the money to carry out the various plans of improvement. The estimated cost, to make the desired improvement on the Whitefish Bay line is \$80,000.

New York.—Justice Truax, in the Supreme Court has handed down a decision in the long legal fight between the Southern Boulevard Railroad Co. and the North New York City Traction Co., as plaintiffs, and the People's Traction Co., as defendant. The Justice grants an injunction to restrain the defendant from proceeding with the construction of a road from the Bronx to the Harlem River.

TRAFFIC.

Traffic Notes.

The Philadelphia & Reading is now running a passenger train between Harrisburg and Philadelphia, 113 miles, in 2 hours and 55 minutes.

The Southwestern Traffic Association has agreed upon an advance of about 11 cents per 100 lbs. in the rates on live stock from the principal Texas points to Chicago.

The new twin screw steamer Pennsylvania, of the Hamburg-American line, sailed from New York last week for Hamburg with a cargo of 18,500 tons, which at 25 tons a car would equal 740 carloads. One of the minor items in the cargo was 294,069 bushels of grain.

L. S. Thorne and E. S. Sargeant, officers of the Texas & Pacific, whose cases were reported last week, have each been fined \$4,000 and costs. There were three counts in the indictments—leasing a warehouse to a consignee, thus virtually giving storage and cartage; paying a rebate of 15 cents a bale on cotton, and absorbing certain cartage charges.

The arbitrators of the Joint Traffic Association, reporting on the question presented by the Erie road, of differential passenger fares between New York and Chicago, have decided that the normal time between the two cities for the standard rate, \$20, shall be 28 hours, and that on all classes of business—first-class, second-class and theatrical—one dollar must be added for each hour or fraction thereof that the time is quickened. The date set for making this ruling effective is that upon which the American Railway Association may fix for general time table changes in the month of May.

The reduction of freight rates from the Atlantic seaboard to Western points by the Norfolk & Western has been followed by a reduction over the Southern Railway to Nashville and Memphis and by the Southern Pacific Company, which takes freight by steamer from New York to New Orleans, on freight rates to St. Louis. The Presidents of the Eastern trunk lines met in New York last Tuesday, and it is said that they assured the Norfolk & Western that they would maintain West-bound rates. It is reported in New York that the alleged reductions by the trunk lines, which, according to the officers of the Norfolk & Western, were the cause of their reduction in tariffs, were made by means of commissions paid to import freight agents, who received 15 per cent. The commission was paid, of course, on condition that the agent should not divide it with the shipper.

Chicago Traffic Matters.

At a meeting of the executive officials of the roads in the Western Freight Association, held Feb. 18, all the differences that were threatening dissension were glossed over. The Illinois Central, which refused to recognize the authority of the organization over rates south of the Ohio River, agreed to acknowledge the authority of the association on both export and import rates by way of New Orleans, from points west of the Mississippi River, on the understanding that the arrangement could be canceled on 30 days' notice.

The Kansas City, Fort Scott & Gulf, which has not heretofore joined the association, came in on the understanding that if after the Kansas City, Pittsburgh & Gulf system had been completed for three months it was found the Fort Scott interest was suffering from its competition, it could withdraw from the organization by giving 30 days' notice. The Chicago Great Western, which had refused to abide by the rulings of the association, thus creating dissension, agreed hereafter to acknowledge the authority of the Board of Administration. On the question of the assessment of fines and penalties, Chairman Midgley and the other members of the Board had up to the time of meeting construed the agreement to mean that they were not compelled to assess fines. The executive officials, however, took action to the effect that, as the agreement strictly provides that penalties or fines shall be inflicted whenever the compact is violated, the Board of Administration has no option but to assess the fines whenever occasion arises.

Eastbound shipments from Chicago and Chicago Junctions to points at and beyond the Western termini of the trunk lines for the week ending Feb. 18 amounted to 116,693 tons, as compared with 117,760 tons the preceding week. This statement includes shipments of 68,914 tons of grain, 12,318 tons of flour and 9,581 tons of provisions, but not live stock. The following is the statement in detail for the two weeks:

Roads.	WEEK ENDING FEB. 18.		WEEK ENDING FEB. 11	
	Tons.	p. c.	Tons.	p. c.
Baltimore & Ohio.....	9,202	7.9	8,325	7.1
C. & C. & St. Louis.....	9,968	8.5	9,171	7.8
Erie.....	8,456	7.3	13,275	11.3
Grand Trunk.....	8,666	7.4	8,545	7.5
L. S. & M. S.....	14,902	12.8	14,008	11.9
Michigan Central.....	15,998	13.7	17,694	15.0
N. Y., Chl. & St. L.....	10,548	7.0	9,407	8.0
Pitts., Ohn., Chl. & St. Louis.....	10,911	9.4	11,150	9.4
Pitts., Ft. Wayne & Chicago.....	19,832	17.0	18,153	15.4
Wabash.....	8,220	7.0	7,752	6.6
Totals.....	116,693	100.0	117,760	100.0